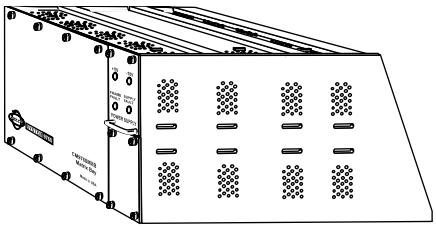

CM9760-MXB/
CM9760-MXBL
System 9760®
Matrix Bay

Installation/
Operation Manual

C543M-A (7/03)

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REVISION HISTORY

Manual #	Date	Comments
C543M	9/97	Original version.
	2/98	Removed references that a second power supply is recommended if the number of input cards exceeds 10. Changed manual pagination.
	6/98	Added Section 1.2, Certifications.
	1/99	Revised Figures 4, 5, 6, 7, 8, and 24 per ECO #98-4147.
	6/99	Running change. Revised Table B for NTSC and PAL models.
C543M-A	7/03	Revised manual for System 9760 support of 2048 cameras and 512 monitors. Also updated graphics of video input, video output, and DFC cards and revised text as necessary. Included other miscellaneous changes.

1.0 GENERAL

1.1 IMPORTANT SAFEGUARDS AND WARNINGS

Please thoroughly familiarize yourself with the information in this manual prior to installation and operation.

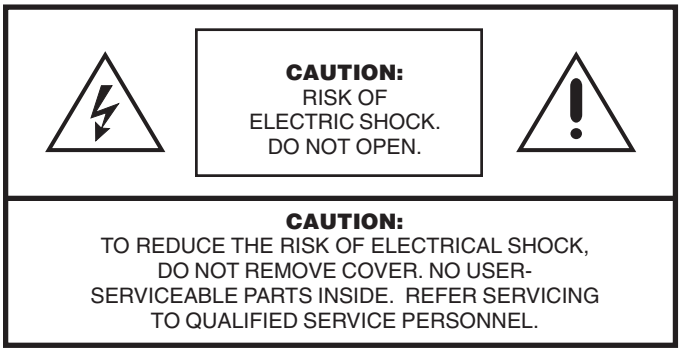
Prior to installation and use of this product, the following WARNINGS should be observed.

1. Installation and servicing should be done only by qualified service personnel and conform to all local codes.
2. Unless the unit meets NEMA Type 3, 3R, 3S, 4, 4X, 6 or 6P standards, it is designed for indoor use only and it must not be installed where exposed to rain and moisture.
3. Only use replacement parts recommended by Pelco.
4. After replacement/repair of this unit's electrical components, conduct a resistance measurement between line and exposed parts to verify the exposed parts have not been connected to line circuitry.

The product and/or manual may bear the following marks:

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



NOTE: *This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

Radio and Television Interference

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTE: *The CM9760-MXBL does not require power; therefore, certification is not required.*

1.2 CERTIFICATIONS

The products identified below have been tested and certified for agency compliance as noted.

	Agency Compliance Certification			
Model	**CE**	**FCC**	**UL**	**cUL**
CM9760-MXB		X	X	X
CM9760-MXB-X	X			

Applicable CE, FCC, UL, and cUL directives/standards:

- 93/68/EEC–CE Mark Directive
  89/336/EEC, 92/31/EEC–Electromagnetic Compatibility (EMC) Directives
- FCC–47 CFR, Part 15, Subpart B, Class A

1.3 UNPACKING INSTRUCTIONS

Unpack and inspect all parts carefully.

The matrix bay you receive should be populated with all the boards and associated cables needed for your particular installation. In addition, jumper settings, board installation locations specific to your order should already be completed.

Be sure to save the shipping box and any packing material, at least until it has been determined that the equipment you have received is working properly. It is best to keep the material anyway in case future problems warrant return of any equipment.

If an item has been damaged in shipment, replace it in its box and contact the factory at 1-800-289-9100 or 1-559-292-1981. (International customers fax 1-559-348-1120 for authorization and instructions.)

If an item needs to be returned to the factory for repair, consult the WARRANTY AND RETURN section of this manual for instructions.

1.4 RECOMMENDED TOOLS

Pelco does not supply basic tools for the installation process. The following tools, however, may be needed to install the product depending on your installation geometry:

Crimp tools
Wire stripper
Straight and Phillips screwdrivers
Coaxial cable stripper
Wire cutter
BNC crimp tool

2.0 GENERAL DESCRIPTION

2.1 OVERVIEW

The matrix bay is a peripheral product that is part of the System 9760® family. The matrix bay provides all video input and output connections for the system. Each unit is capable of accepting up to 256 camera inputs in 16 input increments and provides up to 16 monitor outputs in 4 output increments. If more than 256 camera inputs are needed, sideframing is required (see Section 5.2); if more than 16 monitor outputs are needed, downframing is required (see Section 5.1). Version 8.03.006 and later of CM9760-CC1 operational software enables sideframing and downframing to extend the number of inputs and outputs allowed to 2048 cameras and 128 monitors. With the addition of CM9760-MDA (Master Distribution Amplifier) units, a maximum of 2048 cameras and 512 monitors is supported. Note that the term *camera* includes any device that can transmit a video signal and the term *monitor* includes any device that can receive a video signal. VCRs and multiplexers are examples of devices that can transmit or receive video signals.

All connections are made on the rear of the matrix bay and utilize standard BNC-type connectors for video connections. All video inputs leave the factory terminated with 75 ohms (standard default). Non-termination (where applicable) is jumper selectable.

2.1.1 Models

CM9760-MXB	Video matrix bay equipped with CM9760-MPS power supply. 120 VA, 60 Hz. (UL; cUL; FCC, Class A)
CM9760-MXB-X	Same as CM9760-MXB except 230 VAC, 50 Hz. (CE)
CM9760-MXBL	Video matrix bay for video loop-out connections. Uses downframe looping cards (CM9760-DFL). No power required.

2.1.2 Optional Equipment

CM9760-MPS	Matrix bay power supply (spare). Operates on 120 VAC, 60 Hz.
CM9760-MPS-X	Matrix bay power supply (spare). Operates on 230 VAC, 50 Hz.
CM9760-VCC	Video input (camera) card capable of accepting up to 16 camera inputs. Also requires a rear panel card (CM9760-RPC, CM9760-RPL, CM9760-DFC, or CM9760-DFL).
CM9760-RPC	Rear panel (BNC) card provides 16 BNC connectors used to connect camera inputs to matrix bay.
CM9760-DFC	Downframe card and cable assembly used to connect multiple matrix bays together for output expansion purposes.
CM9760-DFL	Same as CM9760-DFC except has looping inputs.
CM9760-RPL	Double wide rear panel card for single bay looping. Maximum number of inputs per bay reduced to 128.
CM9760-VMC4	Video output (monitor) card providing 4 monitor outputs. Requires CM9760-RPM.
CM9760-VMC8	Video output (monitor) card providing 8 monitor outputs. Requires CM9760-RPM.
CM9760-VMC12	Video output (monitor) card providing 12 monitor outputs. Requires CM9760-RPM.
CM9760-VMC16	Video output (monitor) card provides 16 monitor outputs. Requires CM9760-RPM.
CM9760-VMM	Video output module for expanding CM9760-VMC4, CM9760-VMC8 or CM9760-VMC12 by one monitor output.
CM9760-RPM	Rear Panel (BNC) Card provides 16 BNC connectors used to connect monitor to matrix bay.

2.2 PHYSICAL LAYOUT

The matrix bay consists of the following items:

- Matrix Bay Card Cage
- Video Output Card (the 17th card, consists of one card type; available in 4, 8, 12 or 16 outputs and front loading)
- Video Input Cards (up to 16 total; all identical and front loading)
- Rear Panel Input Cards (there are, at present, four types of Rear Panel Input cards that can plug into any one of 16 rear loading Video Input Card positions)
- Rear Panel Output Card (at present, there exists only one type of Rear Panel Output card)
- Power Supply (shipped as 120 or 230 VAC).

The following paragraphs illustrate and describe the function of each of the bulleted items just mentioned.

2.2.1 Matrix Bay Card Cage

The matrix bay is pictured in Figure 1. The right side panel (power supply side), and the top and bottom panels of all units are perforated with circular cut-outs to facilitate air circulation. Even though the matrix bay is a low power device and contains no separate circulation fans, it is a good idea, if possible, to leave 1 RU (1.75") between it and other installed bays. A fully loaded matrix bay, like all electrical devices, does generate some heat.

The Cage of the matrix bay provides the skeleton into which all the bulleted items listed in Section 2.2 fit. Figure 1 illustrates a matrix bay populated with one power supply (the panel with the handle on it); the covered opening immediately below that has a blank-off plate installed where a second power supply is installed if needed. The card cage cutouts indicated in Figure 1 accept the tabbed appendages of the panels that form the interior walls of the top and bottom power supply bays and anchor them in place. If the installed power supply, the blank-off panel, the right side panel and the large front-cover panel are removed from the unit in Figure 1, one can see the layout of just the cage itself as show in Figure 2.

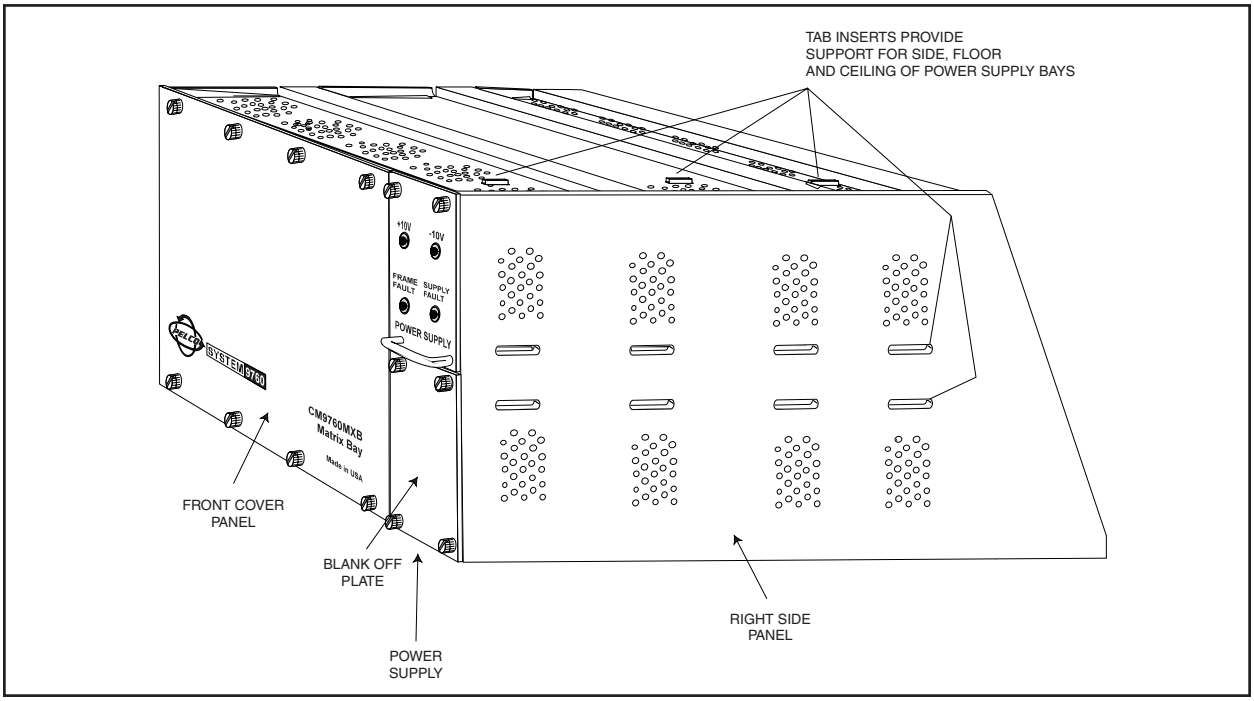


Figure 1. Front of Matrix Bay

As already mentioned, room is made on the right side of the unit for the installation of up to two power supplies. Two guide rails situated at the top and bottom of each power supply bay exist to accept the power supply units. Seventeen sets of guide rails (top & bottom) located to the left of the power supply provide for the installation of up to sixteen Video Input Cards and one Video Output Card. The empty positions are labeled left to right, 1 through 16. The seventeenth position (next to the power supply bays) is the Video Output Card position. The Video Output card is slot specific and must always be installed in this slot position.

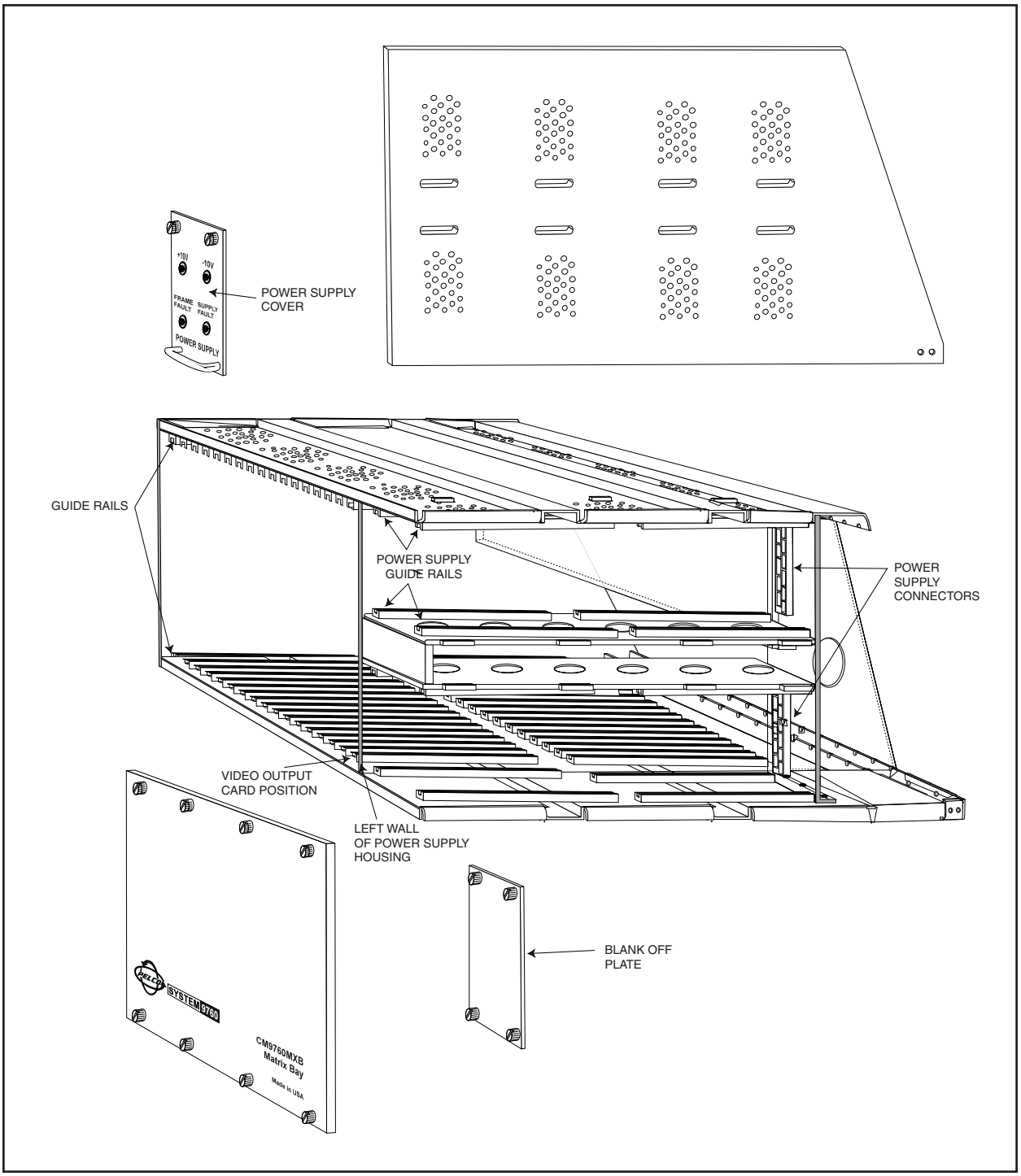


Figure 2. Matrix Bay Card Cage

NOTE: *There are three (3) connectors into which any Video Input or Output Card plugs into: the two on the backplane and one on the appropriate rear panel card (see Figure 3). This connection geometry holds true for all installed front loaded Video Input and Video Output cards.*

Further disassembly allows one to see the backplane upon which are located two of the three connectors into which all installed Video Input and Video Output cards plug into (refer to Figure 3). The back plane is held in place by rectangular bar stock (top and bottom) which runs the width of the bay between the left side panel and the power supply plate which secures it in place. Power supply units, Video Input and Video Output Cards are all installed from the front of the unit. All other cards are installed from the rear of the unit (refer to Figure 4).

Also note in Figure 3 the baffle plate installed for CE purposes with appropriate openings for Rear Panel cards and their connectors to fit through. The baffle plate itself, extends the width and height of the matrix bay itself (excluding power supply sections).

The three connectors (consisting of two on the backplane and a single connector provided by a Rear Panel card as indicated in Figure 3) constitute the connection geometry for all Video Input and Output Cards. For any given card position an associated Rear Panel card (card type dependent on the function of the matrix bay into which it fits) must be installed FIRST.

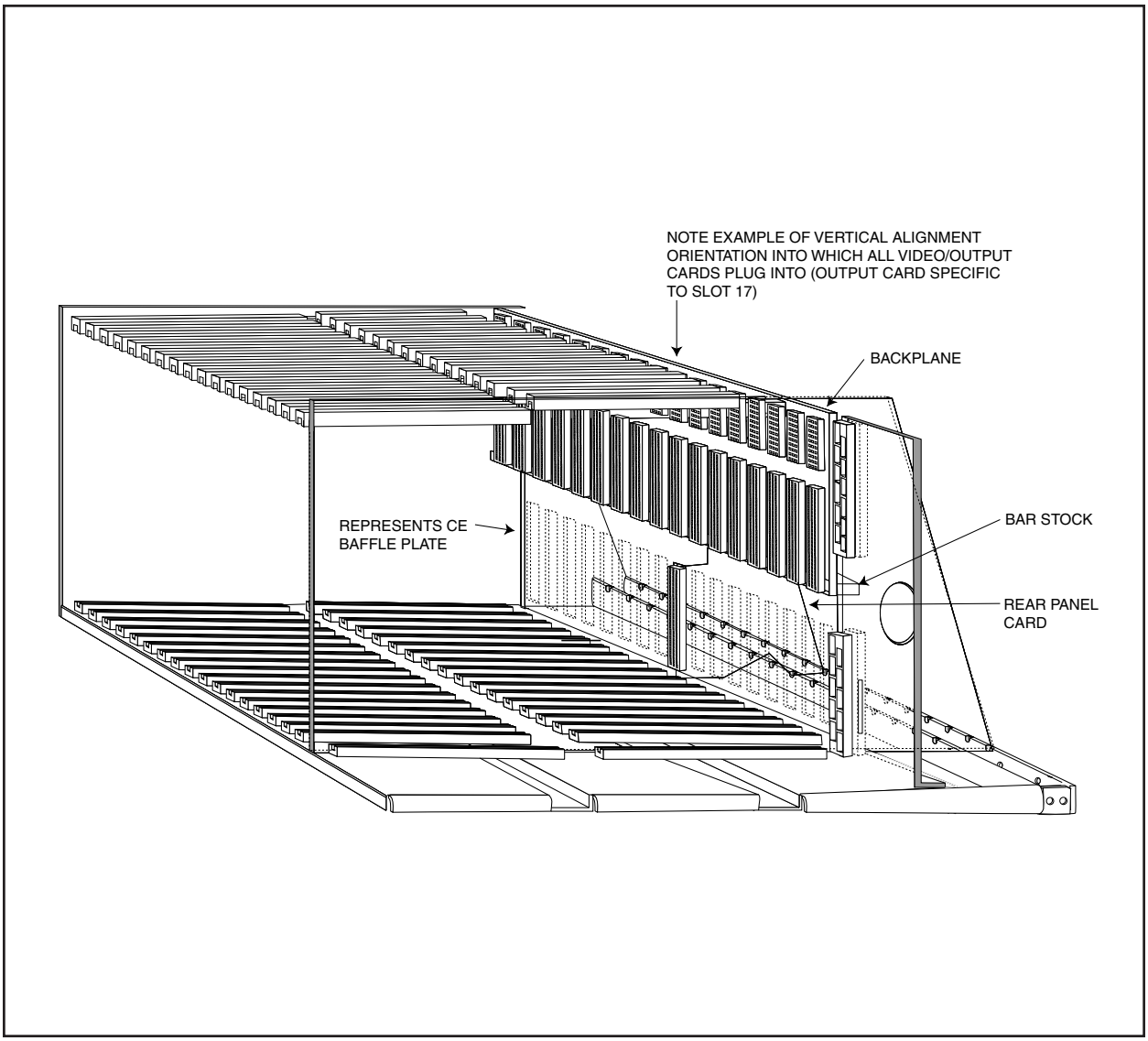


Figure 3. Matrix Bay Connection Geometry

A rear view of an empty matrix bay is shown in Figure 4.

The plate covering the rear section of the matrix bay dedicated to the power supply bays is shown on the left in Figure 4. This panel is populated with several items of importance, refered to in Figure 5. Located at the top left corner of the panel is the Alarm Port connector.

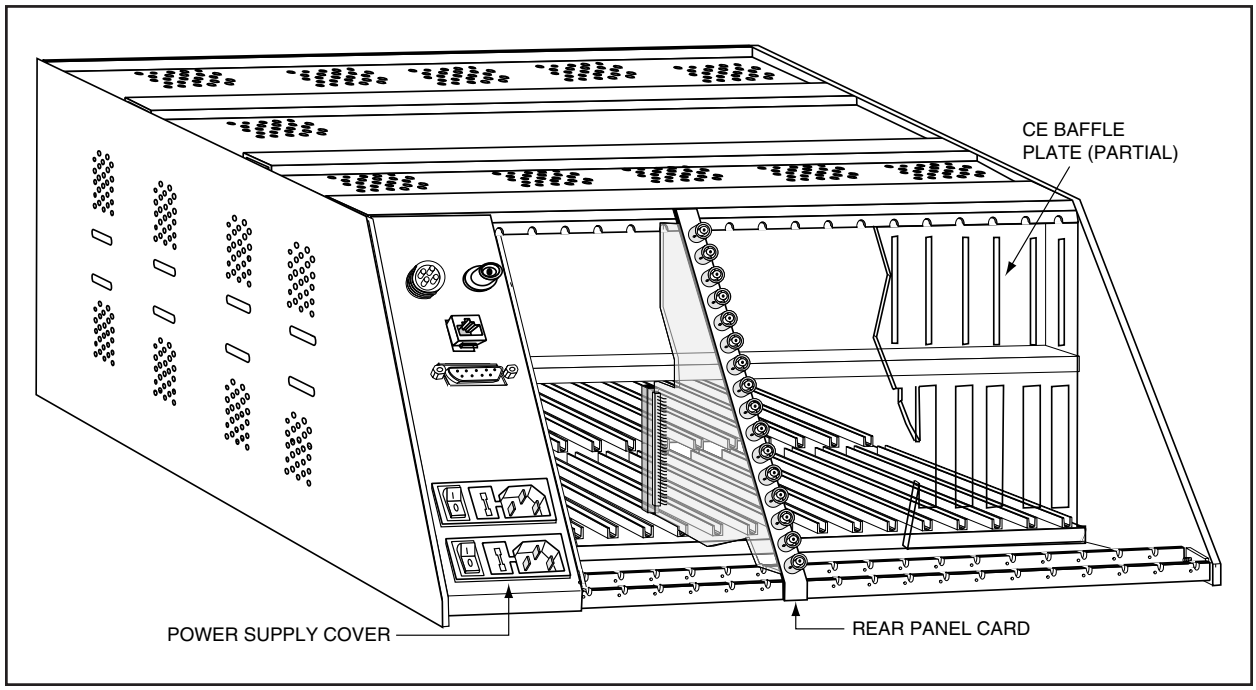


Figure 4. Rear of Matrix Bay

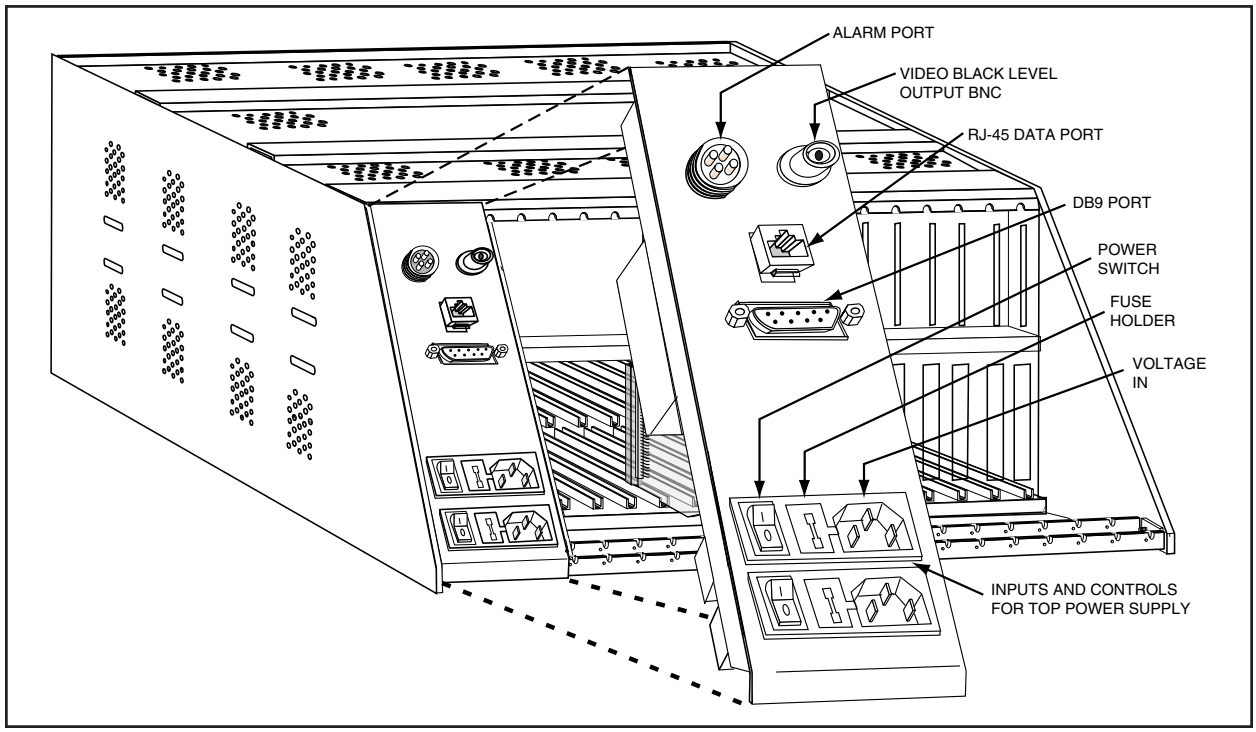


Figure 5. Power Supply Section of Rear Matrix Bay

A single Alarm port is provided with each matrix bay which facilitates a relay output (contact closure) to operate remote alarm circuitry in the event of a system malfunction. The relay operates in conjunction with the front panel fault LEDs (discussed later in Section 3.4) to notify personnel when a hardware problem occurs. The Alarm Relay contact closure will activate (close) if there is:

1. A power supply failure.
2. A frame fault including fuse failure on the Input card.
3. An Output card failure.
4. A communication fault with an Input or Output card.

If wiring to this port, use the 4-pin audio connector supplied with the unit (refer to Figure 6 and Table A).

Table A. Alarm Port Pin Definition

Pin	Description
1	Relay One Common
2	Relay One Normally Open
3	Not Used
4	Not Used

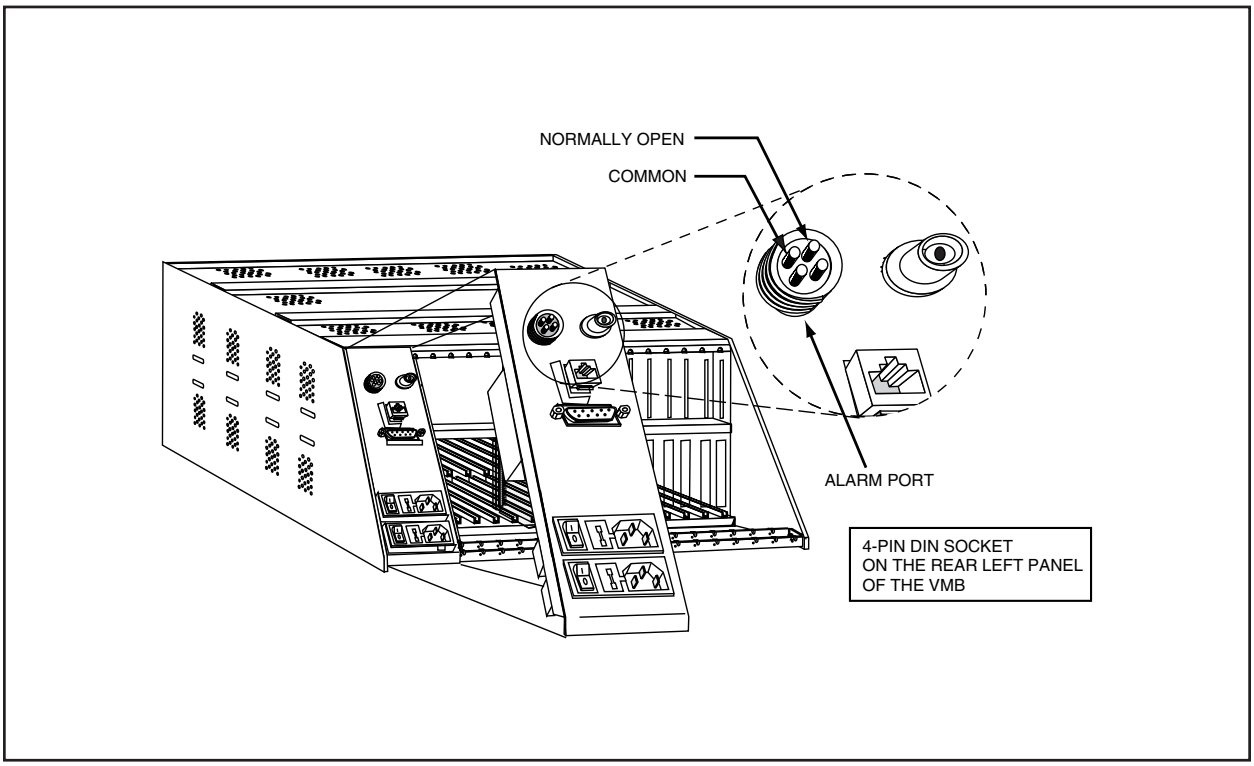


Figure 6. Alarm Connector

To the right of the Alarm Connector is a Video Black Level Output BNC which can be used as a reference sync output to allow for genlocking of peripheral devices. The signal level for this output is 300 mV. The connection for this output is a standard BNC connector. The output has a 75-ohm termination. The Video Black Level BNC can be seen in Figure 5.

Below the two connectors just discussed is the RJ-45 connector or data port, which provides the main RS-422 communication path between the matrix bay and an appropriate SerCom port on the rear of a CM9760-CC1.

Power supply input terminal plugs, ON/OFF switches, and power supply input fuses for both power supply positions (whether the power supply is installed or not) are located at the bottom of the power supply panel. The top set of this twin configuration is for the top power supply; the bottom for the bottom (refer to Figure 5). Further details of power supply configuration are discussed in Section 2.2.5 and 3.2.

To the right of the power supply bays are the openings for installing the rear panel Input and Output cards. These cards provide a video signal path for the Video Input and Output cards that plug into the matrix bay from the front. These unique, triangular shaped cards are held laterally in place by top and bottom notched rails and a small rear portion of the guide rail into which the cards fit (refer to Figure 7).

In addition, the cards are snugly secured to the matrix bay frame by screws which hold the top and bottom of each card's faceplate to the frame of the matrix bay (refer to Figure 8). The dual BNC Rear Input card discussed in Section 2.2.4 is held in place with four screws, two at top and two at bottom. Unused rear openings are covered by appropriately sized blank plates.

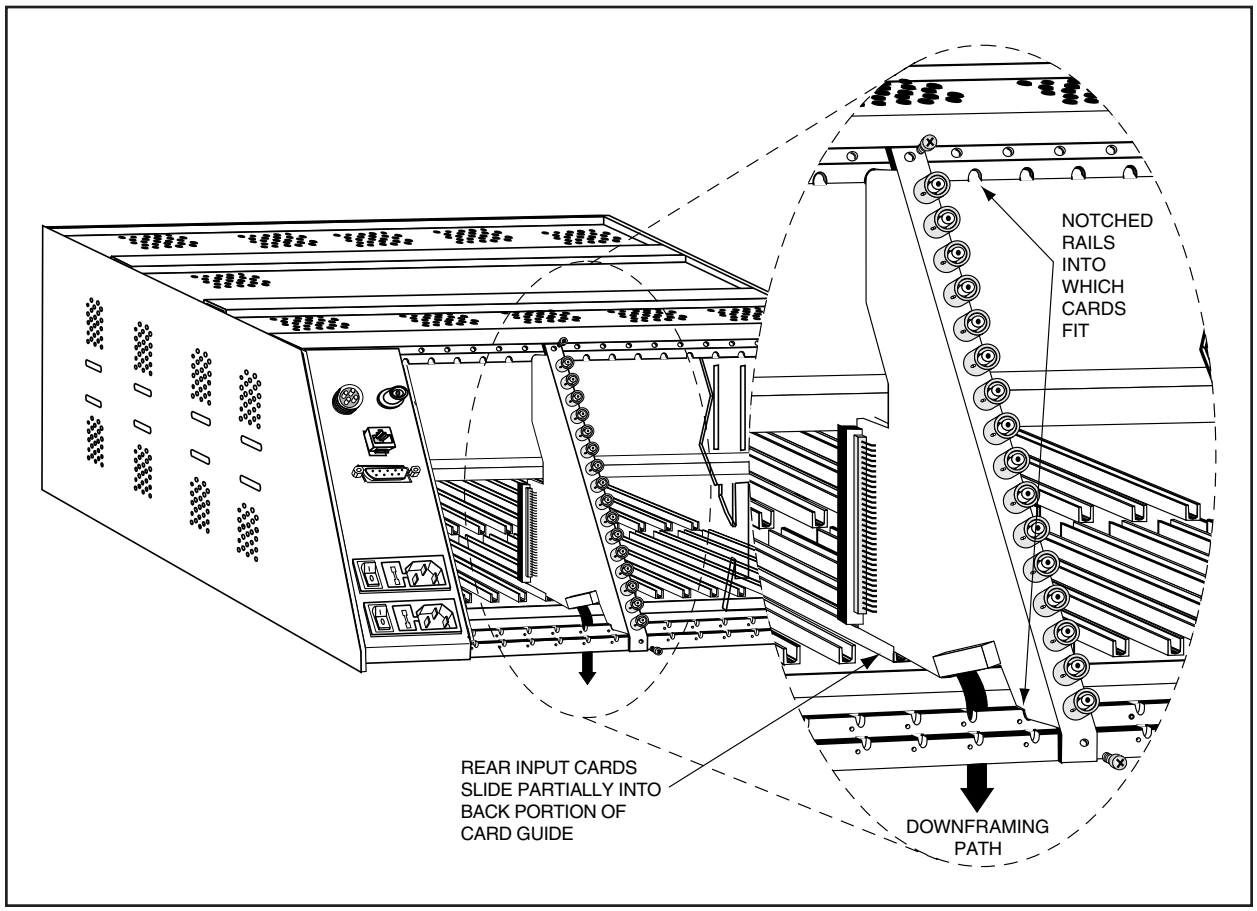


Figure 7. Matrix Bay and Rear Input Cards

These rear input cards should always be installed ***FIRST***, **before** the corresponding Video Input and/or Output cards in the front of the unit are installed.

If we remove the left rear power supply panel with its associated connectors, you can better visualize the backside of the power supply connectors into which the individual power supplies inserted from the front of the matrix bay are located. External power connected to the rear power supply input panels is routed and attached to these connectors to provide input power for the power supply itself (refer to Figure 9).

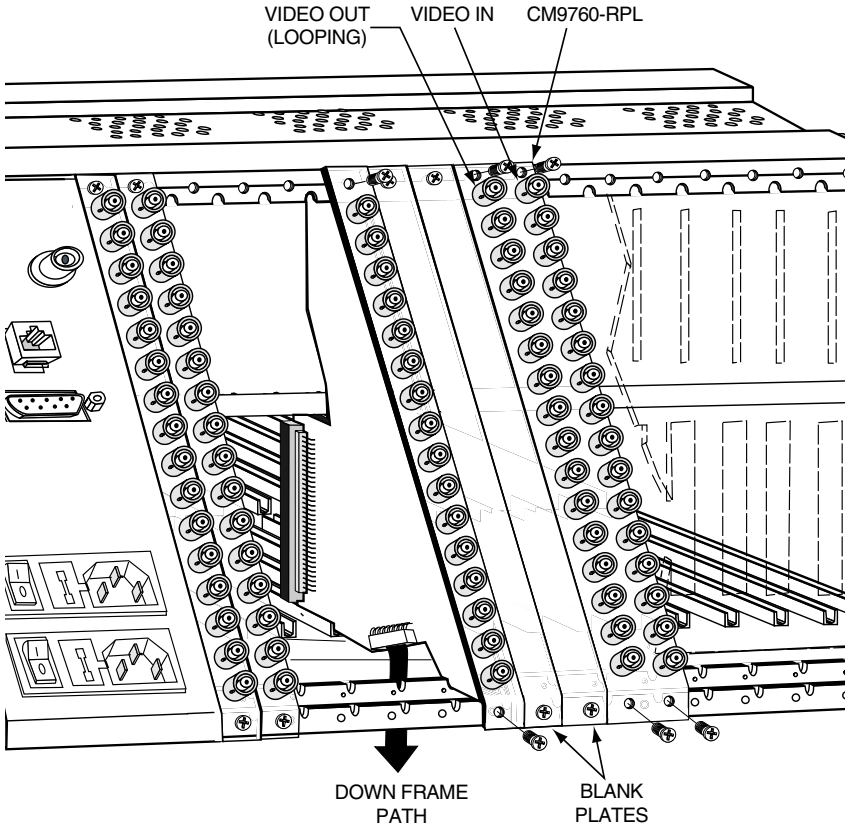


Figure 8. Rear Input Card Mounting

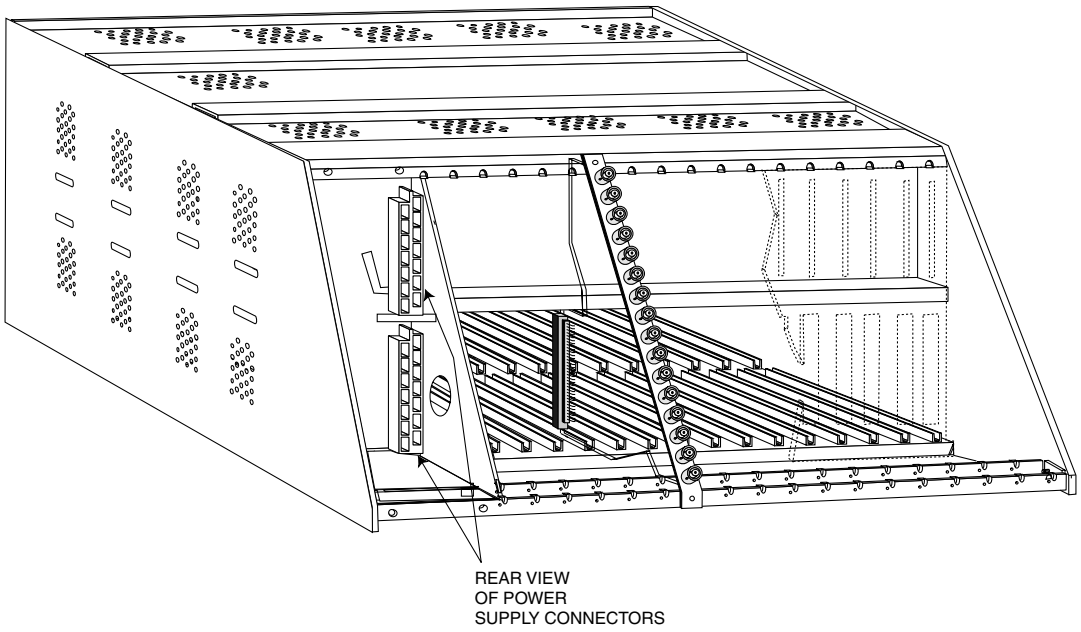


Figure 9. Rear Input Power Supply Connector

2.2.2 Video Output Card

Pelco Part Number Designation (CM9760-VMC)

What Does It Look Like?

The Video Output Card can contain up to 16 monitor outputs with titling. The card may be purchased with 4, 8, 12, or 16 monitor outputs:

- CM9760-VMC4—provides 4 monitor outputs.
- CM9760-VMC8—provides 8 monitor outputs.
- CM9760-VMC12—provides 12 monitor outputs.
- CM9760-VMC16—provides 16 monitor outputs.

Figure 10 illustrates the CM9760-VMC16 Video Output Card.

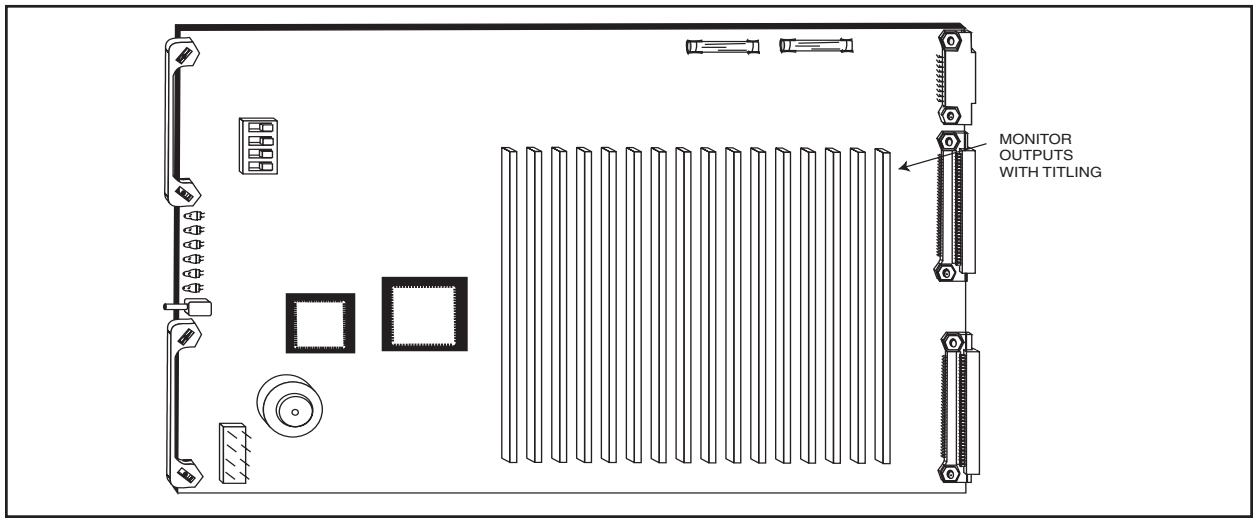


Figure 10. Video Output Card with 16 Monitor Outputs (CM9760-VMC16)

Note that a CM9760-VMM video output module can expand the number of monitor outputs on a CM9760-VMC4, CM9760-VMC8, and CM9760-VMC12 Video Output Card. Each CM9760-VMM video output module provides one monitor output.

Where Is It Installed?

The Video Output Card is located behind the front cover of the matrix bay. It is the only card that is slot specific in the matrix bay (slot 17, to be specific). Refer to Figure 11. To install, simply line up the edges of the card with the top and bottom card guides, slide the card in toward the rear of the unit until it is seated firmly with the connectors on the back plane as well as with any associated rear panel card connector. To remove, grab the handles on the front card edge and firmly pull straight out.

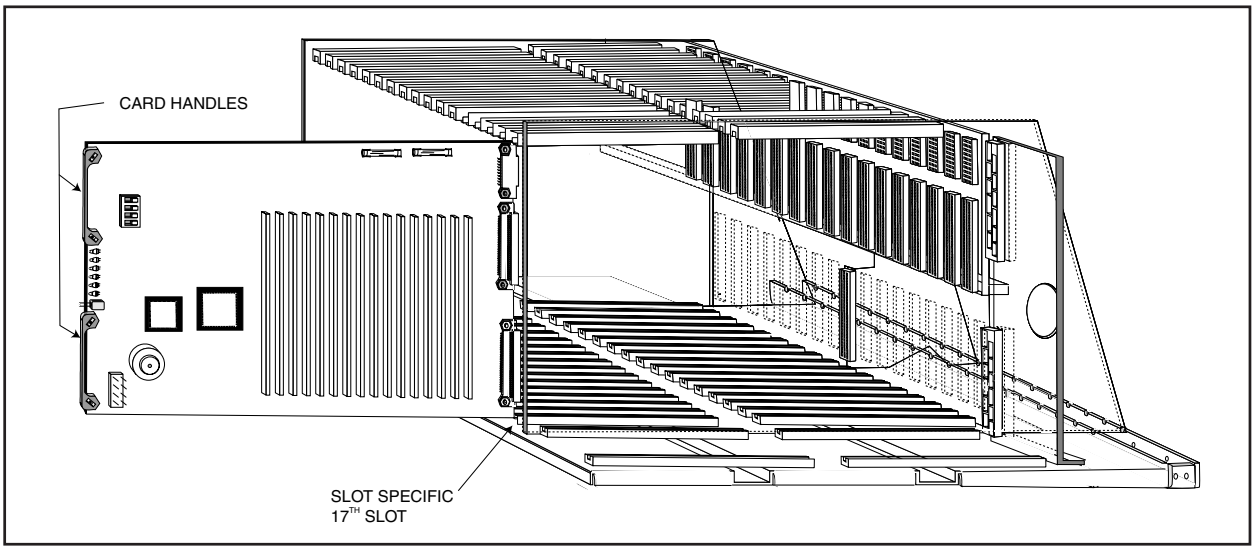


Figure 11. Video Output Card Installation

What Are Its Functions?

The Video Output Card handles several functions; the most important of which are:

1. Routes regular video from the internal input bus, adds idents (if applicable) and routes the signal through the system to the output monitors.

2. In the case of video loss, the output card will maintain video reference levels and route black video for ident purposes.

3. Video loss compensation throughout the system via the video output amplifier.

Other Important Items

DIP Switch and Jumper Settings

The matrix bay has a DIP switch (S2) and jumpers (JP2 and X55) located on the Video Output Card that enable the selection of different options. These are normally set in the proper position upon leaving the factory. However, it is recommended that the settings be checked prior to operating the system (the other “front loading” Video Input Cards have no DIP switches or jumpers to verify). Refer to the following paragraphs for a complete description of the switches and jumpers on the Video Output Card.

Refer to Figure 12. Switch S2 determines the communications baud rate, how the system will operate on power up and whether video loss detection is enabled or disabled. Refer to Table B for S2 switch assignments.

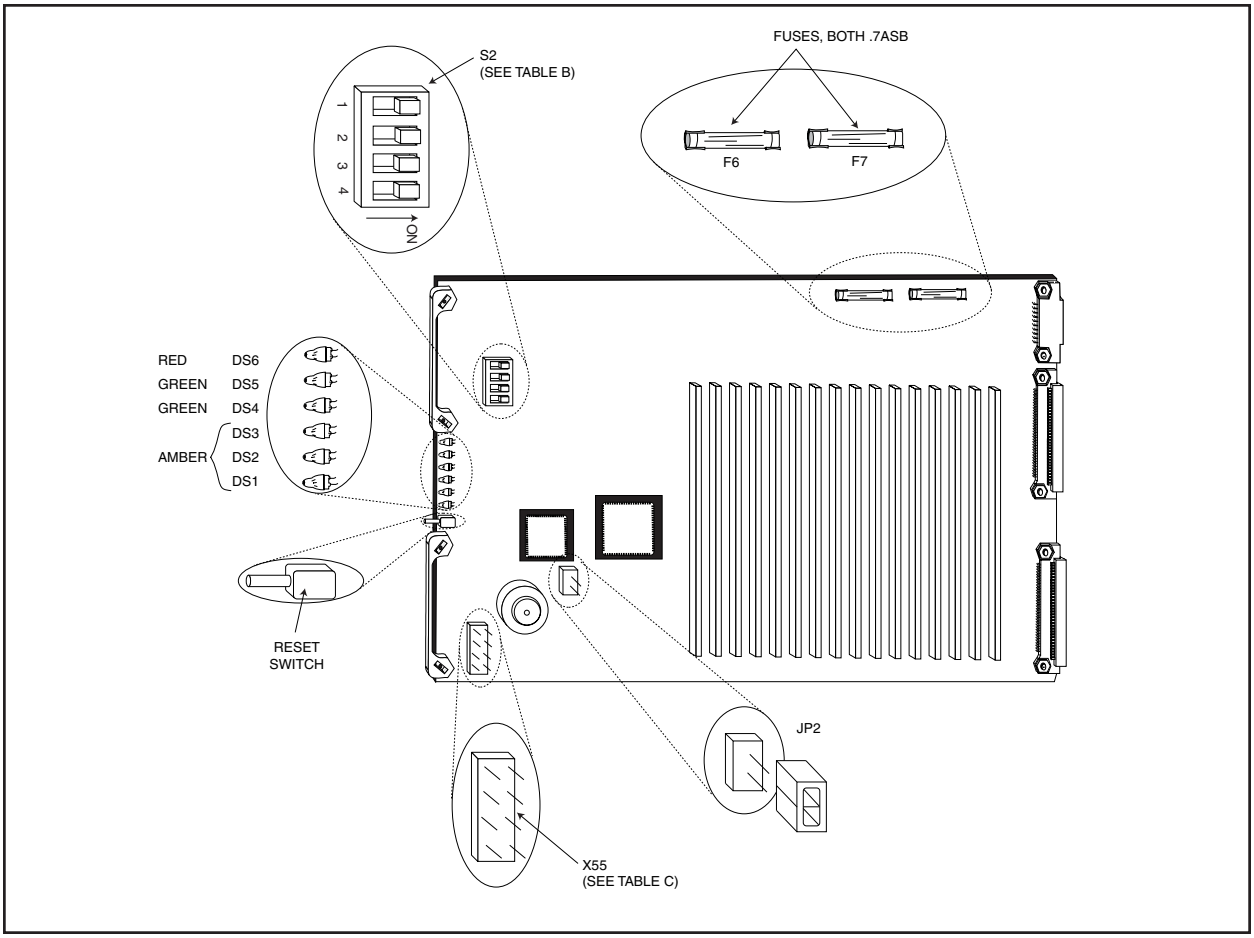


Figure 12. Location of DIP Switches, Jumpers and Fuses

DIP switch 2 has the following functions:

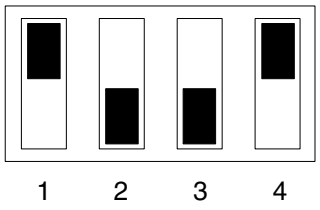


Table B. Output Card S2 Functions

Description	S02			
	1	2	3	4
2400 Baud	OFF	OFF		
4800 Baud	OFF	ON		
9600 Baud	ON	OFF		
19.2 K Baud	ON	ON		
NTSC*			OFF	
PAL*			ON	
Default setting				OFF
Must be ON for VIDEO LOSS feature to operate				ON

*X55 jumpers (refer to Table C) need to be set per Table C.

Setting the Jumpers on the Video Output Card

There are two jumper locations on the Video Output Card (refer to Figure 12 inset). JP2 and X55. JP2 is used to control the program loading sequence and must always have a jumper installed for proper operation. X55 is an eight-position header used to set the standard required for video black generator operation. Refer to Table C for a complete list of the available standards and the jumper location.

JP2 is a two-pin header used to control the program loading sequence and must always have a jumper installed for proper operation.

X55 is an eight-pin header used to set the video standard for the video black generator.

Table C. X55 Jumper Definitions

STANDARD	OSC. FREQ.	1-2	3-4	5-6	7-8
SECAM1	5.0 MHz	ON	ON	ON	ON
SECAM2	5.0 MHz	ON	ON	OFF	ON
624	5.0 MHz	ON	OFF	ON	ON
PAL/CCIR	5.0 Mhz	ON	OFF	OFF	ON
NTSC1	5.034964 MHz	ON	ON	ON	OFF
NTSC2	5.034964 MHz	ON	ON	OFF	OFF
524	5.034964 MHz	ON	OFF	ON	OFF
PAL-M	5.034964 MHz	ON	OFF	OFF	OFF

Video Output Card LEDs

The Video Output Card is equipped with six LEDs labeled DS1, DS2, DS3, DS4, DS5, and DS6. Refer to Table D for a complete description of the Video Output Card LEDs. Refer to Section 3.4.1 for further information regarding LED diagnostic checks.

Table D. Video Output Card LED Assignments

LED	COLOR	WHEN LED IS ON
DS1 to DS3	Amber	Always ON, No assignment
DS4	Green	-10 VDC is OK
DS5	Green	+10 VDC is OK
DS6	RED	Communications failure with the CM9760-CC1

2.2.3 Video Input Card

Pelco Part Number Designation (CM9760-VCC)

What Does It Look Like?

The Video Input Card is illustrated in Figure 13

There can be from 1 to 16 Video Input Cards installed in a matrix bay. Your particular matrix bay has been shipped from the factory with the specified cards installed.

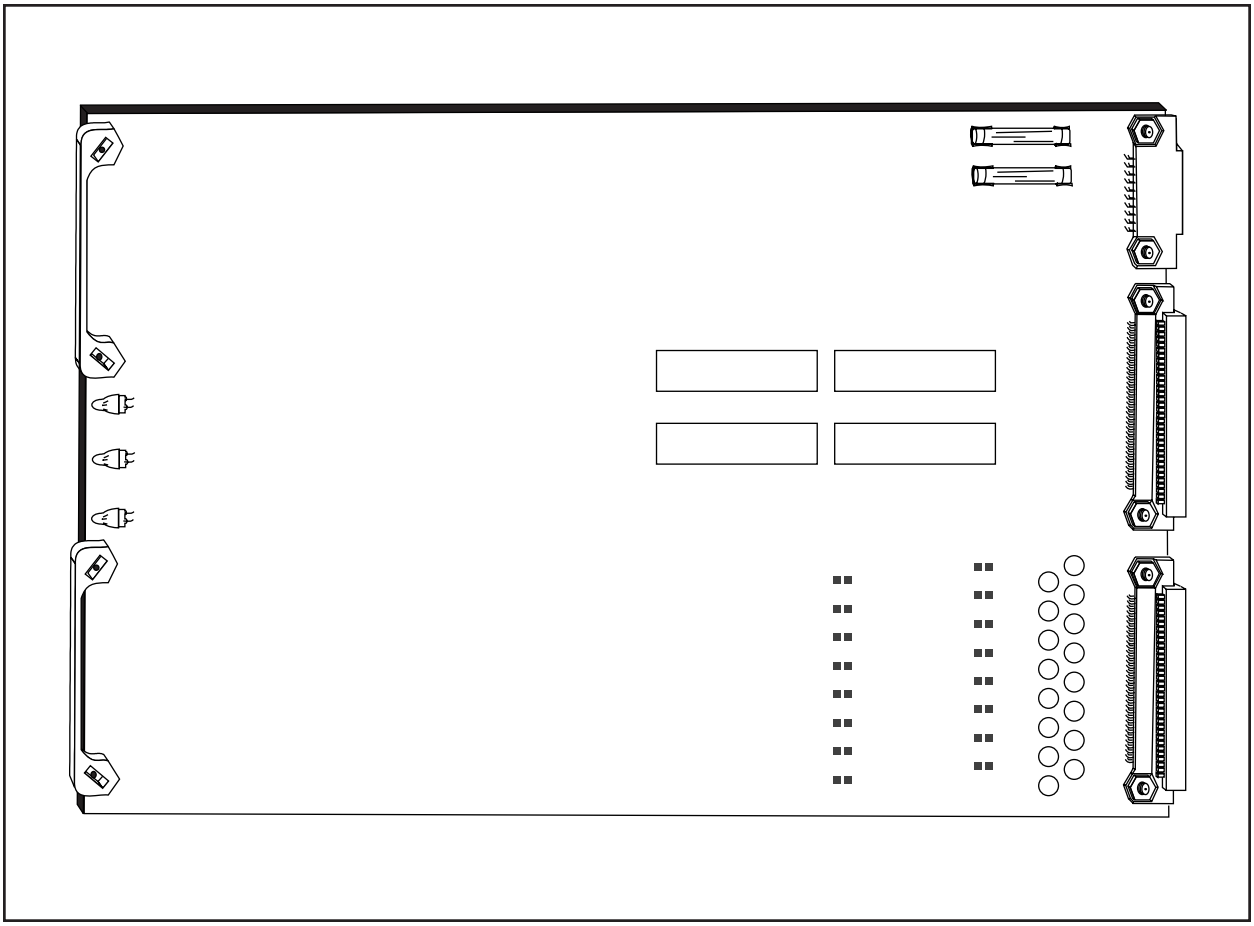


Figure 13. Video Input Card

Where Is It Installed?

The Video Input Card is located behind the front panel of the matrix bay and is found in any one or all of the available 16 slots provided there. Video Input cards are not slot specific (any card can go into any slot) but there are some items to keep in mind. The first and most important is the fact that, although the board can be put into any position, each slot position does correspond to a specific range of physical inputs; i.e. slot position 1 (on the far left of the matrix bay) corresponds to physical inputs 1-16; slot 2 corresponds to physical inputs 17-32, and so on. If you do not install the cards in sequential order, this must be taken into account when programming the system. Table E gives a quick reference for determining the range of inputs for any slot position (also refer to Figure 14).

The second item to keep in mind is that the rear panel BNC Input card associated with the Video Input Card you are getting ready to install should already be in place and matched up with your slot position choice.

The physical removal and installation for this card is the same as that discussed for the Video Output Card.

Table E. Physical Input Range Per Slot Position

Slot Position	1	2	3	4	5	6	7	8
Physical Range	1-16	17-32	33-48	49-64	65-80	81-96	97-112	113-128

Slot Position	9	10	11	12	13	14	15	16
Physical Range	129-144	145-160	161-176	177-192	193-208	209-224	225-240	241-256

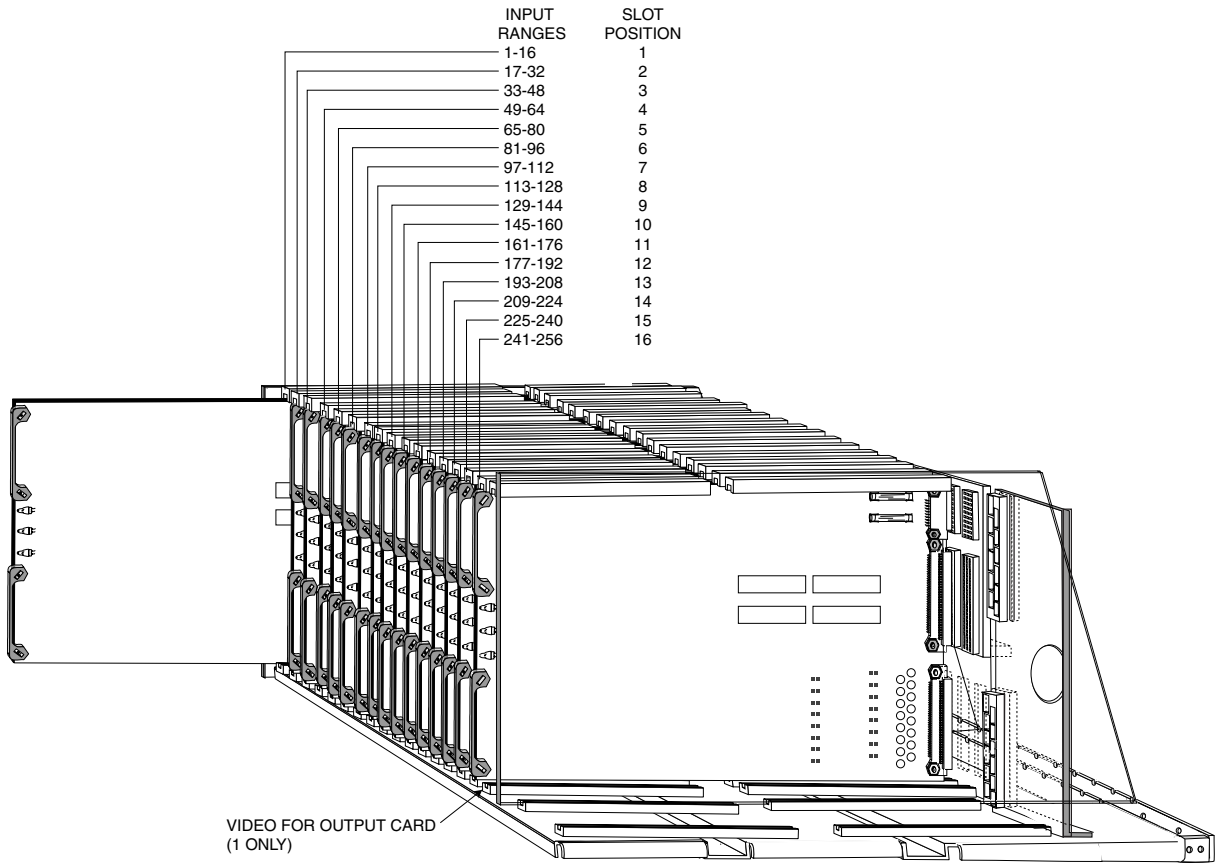


Figure 14. Video Input Card Installation

What Are Its Functions?

The Video Input Card also handles several functions:

1. The card accepts up to 16 video input signals from the Rear Panel BNC Card and switches them to the 16 lines of the video output bus.

2. Accepts and acts upon control data coming from the Video Output Card.

3. Synchronizes matrix switching with the vertical interval and reports card status.

4. Acts as a power-up configuration watchdog and monitors serial communications with the output card controller and causes the COMMS failure LED to light as a result of any conditions that can cause a communication failure.

5. Monitors Video Loss and raises a video fail flag in the case of signal loss and notifies the Output Card Controller.

Other Important Items

Video Input Card LEDs

Each of the 16 possible Video Input Cards is equipped with three LEDs labeled CR1, CR2, and CR3. Refer to Table F for a complete description of the Video Input Card LEDs. Further information regarding LED diagnostics is found in Section 3.4.

Table F. Video Input Card LED Assignments

LED	COLOR	WHEN LED IS ON
CR1	Red	Communications failure with the CM9760-CC1
CR2	Green	+10 VDC is OK
CR3	Green	–10 VDC is OK

The Video Input Card has no jumper or switch settings to worry about.

Video Input Card Fusing

Two power fuses, F1 and F2 exist on each Video Input Card. Refer to Figure 15 for fuse locations. Both of the front panel LEDs should be lit at all times (CR2 and CR3). If one or both are Out on any card, remove the affected card, and check the fuses. Replace defective fuses and reinstall the card.

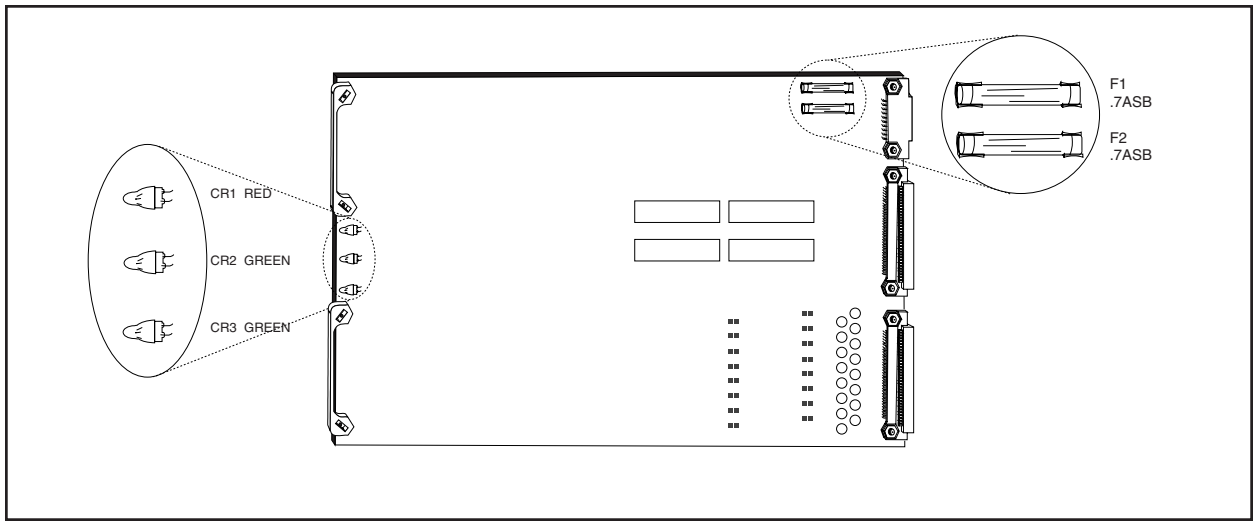


Figure 15. Input Card LED and Fusing Locations

2.2.4 Rear Panel Input/Output Cards

Pelco Part # Designations

CM9760-RPC	(Rear Panel Input BNC Card for CM9760-VCC)
CM9760-DFL	(Rear Panel Input Looping Downframe Card)
CM9760-DFC	(Rear Panel Downframe Card, No Looping)
CM9760-RPL	(Rear Panel Localized Looping Within the Same Matrix Bay)
CM9760-RPM	(Rear Panel Output BNC Card for CM9760-VMC)

CM9760-RPC (Rear Panel Input BNC Card for CM9760-VCC)

What Does It Look Like?

The Rear Panel Input BNC Card is illustrated in Figure 16.

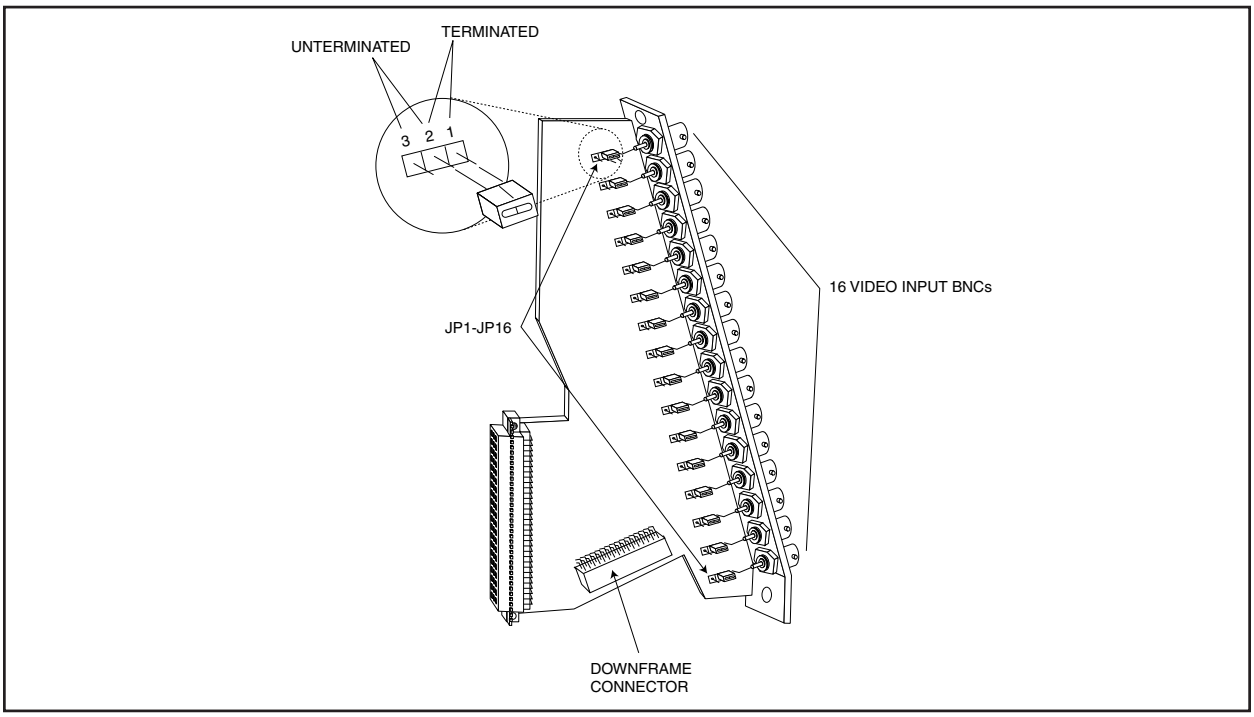


Figure 16. CM9760-RPC Rear Panel BNC Input Card

What Are Its Functions?

The RPC card handles Video Input to the matrix bay. From 1 to 16 cards can occupy a single matrix bay. Each card has 16 BNC inputs. When the multiplication is done, up to 256 Video Inputs are available on a fully populated matrix bay. Each front loaded Video Input Card requires that a corresponding Rear Panel Input BNC card (CM9760-RPC) be installed.

The RPC card serves several functions:

1. Physical connection point for Coax Cable.
2. The Rear Panel BNC Input Card passes the external Video signal to the Video Input card.
3. All 16 Input Video Signals are also made available at the 16-pin connector canted at an angle and located toward the bottom of the board (refer to Figure 16).
4. Video Input Signals can also be terminated, if applicable, with individual jumpers accessible on the board at each of the 16 video inputs (refer to Figure 16).

Note the following about the termination jumpers on the RPC card:

- In a single-bay configuration (up to 256 cameras and 16 monitors), the jumpers on the RPC card must be set in the terminated position. Refer to Section 5.1 for an illustration of a single-bay configuration.
- In a downframe configuration, the jumpers on the RPC card must be set in the unterminated position. Refer to Section 5.1 for information about downframing.
- In a sideframe configuration, the jumpers on the RPC card must be set in the unterminated position. Refer to Section 5.2 for information about sideframing.

Where Is It Installed?

The Rear Panel Video Input Card is installed from the rear of the matrix bay in any 1 of 16 possible slot positions depending on your system configuration. Remember that each RPC card is associated with a corresponding Video Input Card. Locate the correct slot position and install the card as shown. Refer to Figure 17 for typical installation geometry.

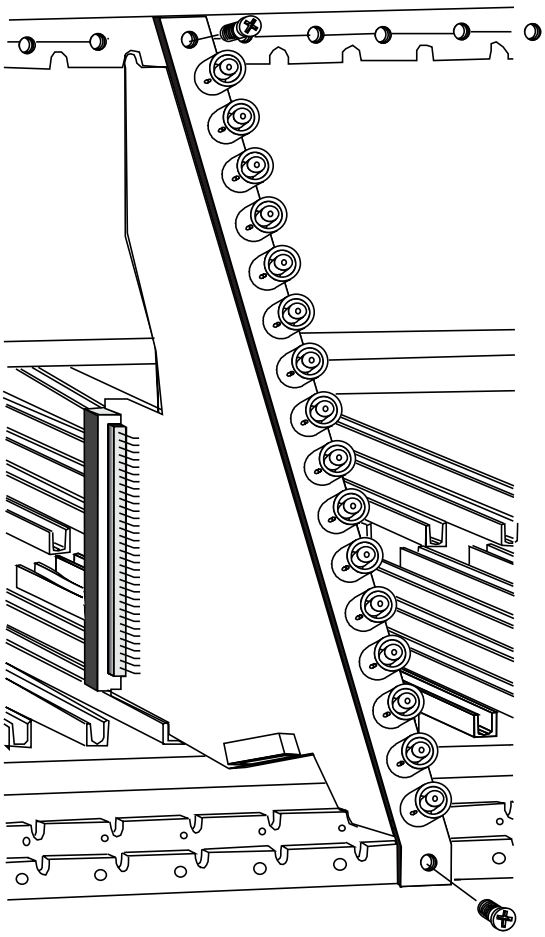


Figure 17. Installation of RPC Input Card

CM9760-DFL (Rear Panel Downframe Looping Card)

What Does It Look Like?

The DFL card is essentially an RPC card with an attached downframing cable. The card itself looks like the one pictured in Figure 16.

What Are Its Functions?

The DFL card is used in the last bay in a downframe configuration and provides the capability to loop out video. The card contains termination jumpers that must be set in the unterminated position when looping to another device is required. When looping is not required, the termination jumpers must be set in the terminated position.

The DFL card can be used in the CM9760-MXB to increase the number of available monitors whether or not looping is required. In addition, the DFL card is the only card that can be used in the CM9760-MXBL, which is an unpowered, downframed matrix bay that contains 16 DFL card slots for supporting 256 video loop-out connections. (When looping is required in a 9760 system that has 16 or fewer monitors and more than 128 cameras, the CM9760-MXBL containing DFLs must be used.)

For additional information about the DFL card, refer to Section 5.1.

Where Is It Installed?

Physically (as long as function parameters are met), a DFL card can be installed in any slot position.

CM9760-DFC (Rear Panel Downframe Card, No Looping)

What Does It Look Like?

The DFC card is illustrated in Figure 18.

Note that instead of BNC connectors on the spine of the card there are two identical 16-pin male connectors. Note that there are termination jumpers on the board. Also note that there is no connector located on the bottom area of the board as was the case for previously illustrated rear panel cards. The DFC card is supplied with a downframing cable.

What Are Its Functions?

The downframe card's almost sole function is as its name implies — to provide a signal path for the addition of more monitors in extended framing situations while at the same time aiding full cross-point functionality of the downframed configuration. For every bay between the first and last, a DFC card is used to interconnect the associated intermediate bays. The DFC card can also be used in the last bay in a downframe configuration. Note that when the DFC card is used in the intermediate bays, the termination jumpers must be set in the unterminated position. When the DFC card is used in the last bay in a downframe configuration, the termination jumpers must be set in the terminated position.

Where Is It Installed?

It is installed in any of the 16 slot positions of any bay in a downframing configuration where it is needed. It is physically installed in the same manner as any other rear panel card. For additional information, refer to Section 5.1 on downframing.

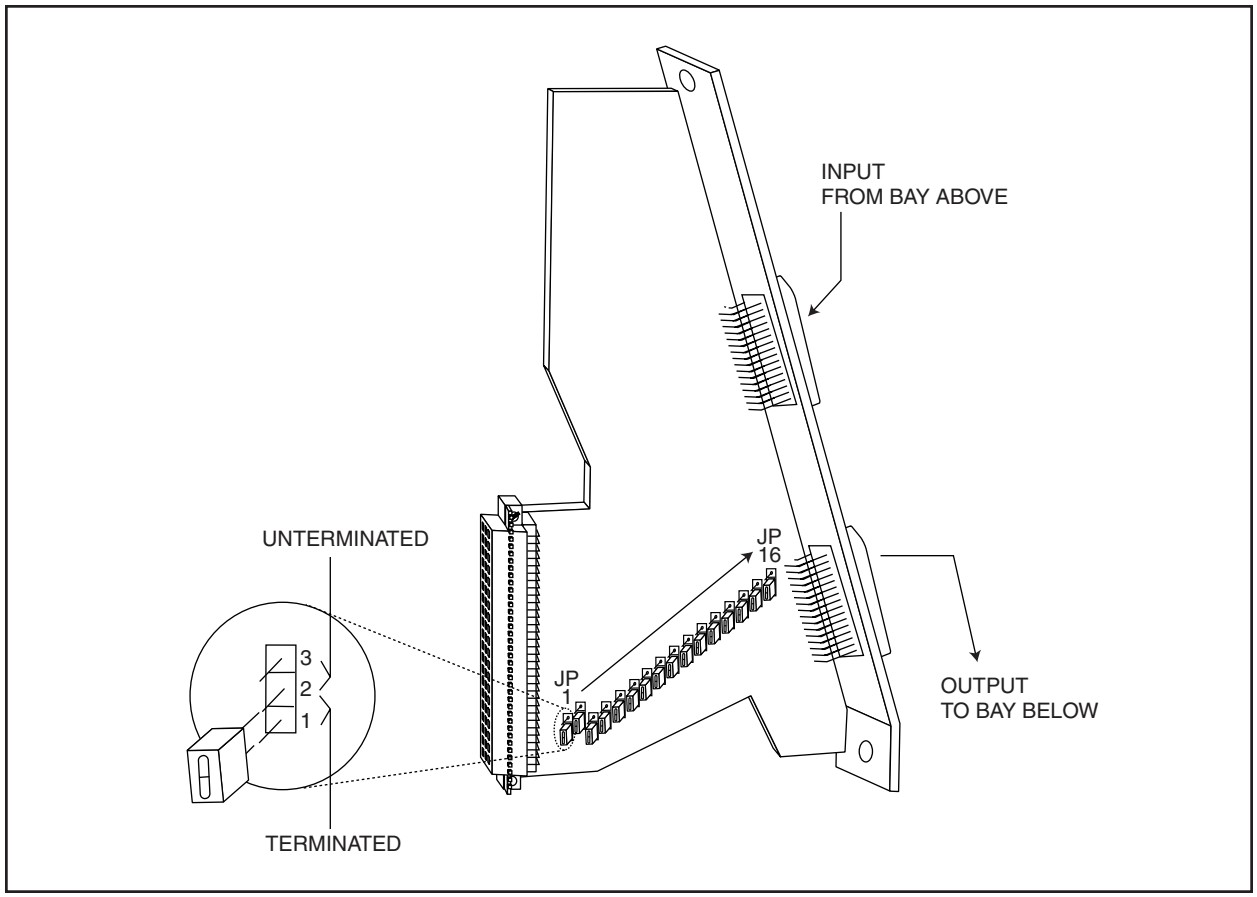


Figure 18. DFC Card

CM9760-RPL (Rear Panel Localized Looping Within the Same Matrix Bay)

What Does It Look Like?

The RPL card is illustrated in Figure 19.

Note the double row of BNC connectors running down the spine of the card. Also note that the card takes up two slot positions instead of one and that the card contains termination jumpers. The jumpers must be set in the unterminated position when looping functions are required. When looping functions are not required, the jumpers must be set in the terminated position.

What Are Its Functions?

The RPL card provides a convenient solution for those installations where looping functions are desired and the total number of camera or video signal inputs for looping does not exceed 128. Since each card takes up two slot positions, you have only half of the normally available 256 inputs available for looping. Note that only odd slot positions (in a fully populated bay) would be occupied and that the corresponding front loaded Video Input card would also occupy odd slot positions.

Where Is It Installed?

In the same manner as RPC cards, but where looping functions are desirable.

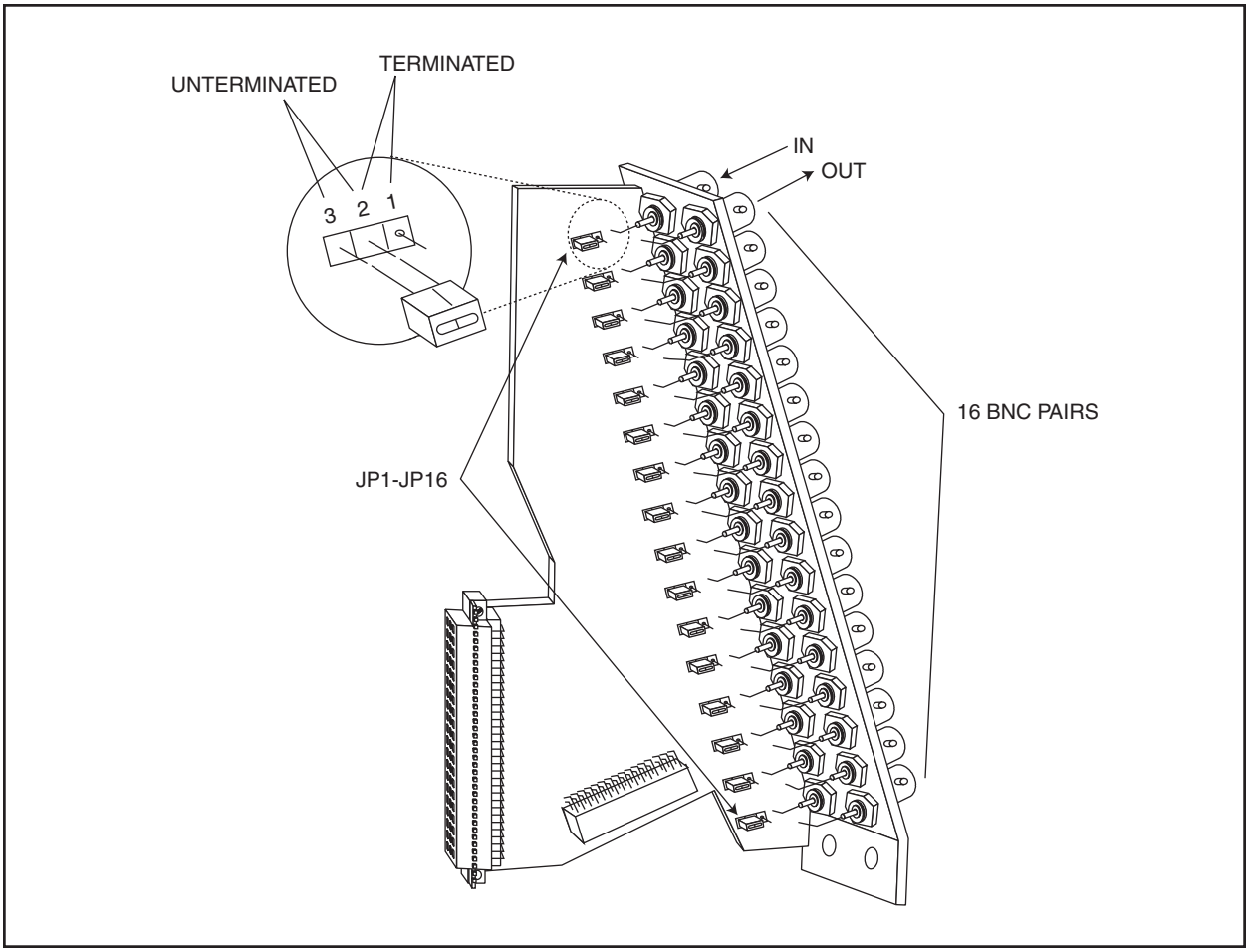


Figure 19. RPL Card

CM9760-RPM (Rear Panel Output BNC Card for CM9760-VMC)

What Does It Look Like?

The CM9760-RPM rear panel output card is associated with the CM9760-VMC card. Note that the RPM card contains termination jumpers that must always be set in the unterminated position. The device to which the RPM card passes its signal is the point where termination should take place (e.g., a monitor).

What Are Its Functions?

1. Provides signal path for Video Output Card

2. Provides physical BNC connection for external use of Video signal (monitor, VCR, etc.)

Where Is It Installed?

The card is slot specific and MUST always be installed in the rear position that corresponds to the front loaded Video Output Card position as viewed from the front of the matrix bay, which is slot 17 (refer to Figure 11 or 14).

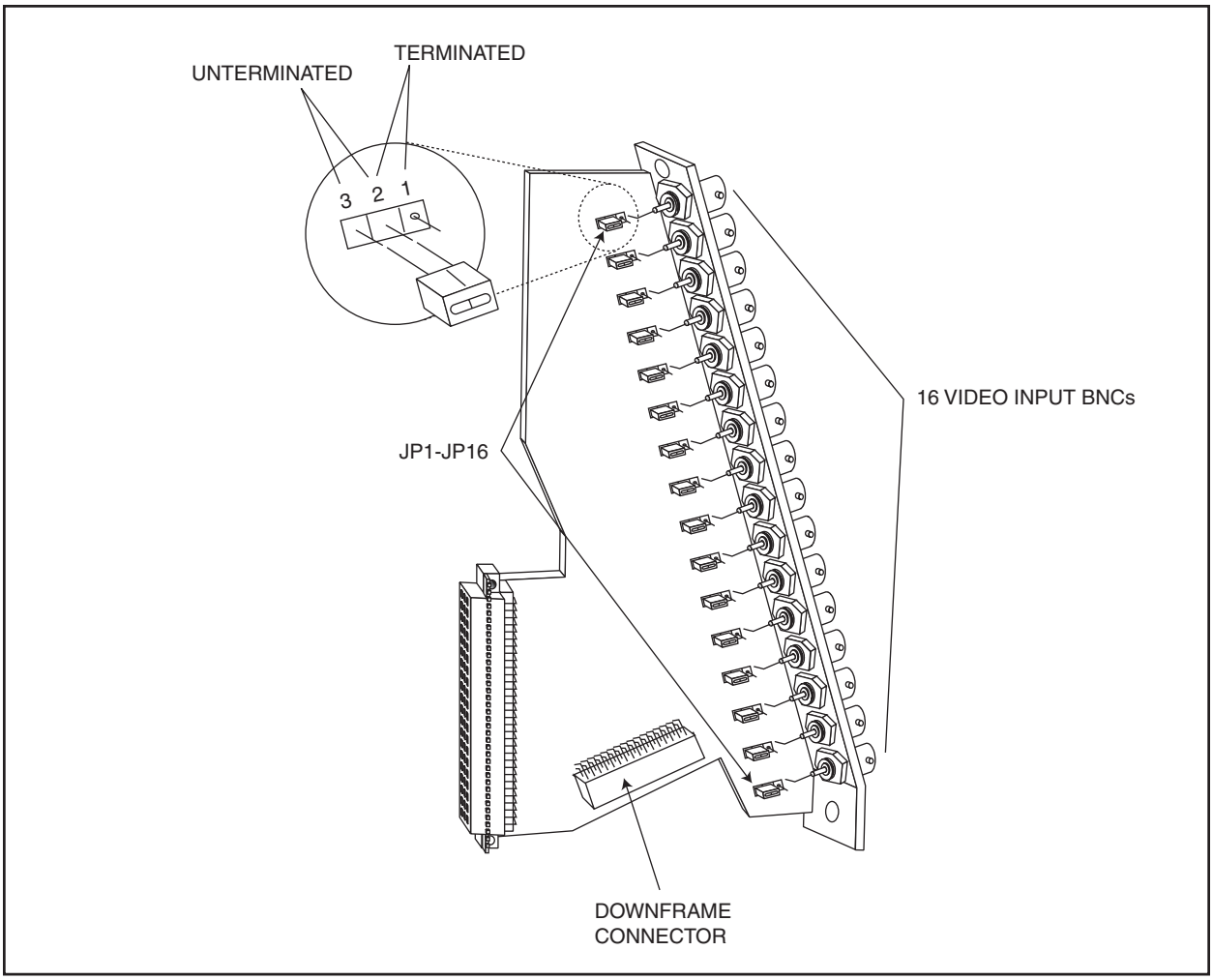


Figure 20. CM9760-RPM Video Output Card

2.2.5 Power Supply

Note that the power supply bays are on the right side of the unit (one directly above the other). An installed power supply is characteristically identified by its handle and the four LEDs on its front plate. An unoccupied power supply bay is covered with a blank-off plate as previously shown in Figure 1.

Installing an Additional or Redundant Power Supply

The matrix bay accepts two separate power supplies. When shipped, unless specified otherwise, the unit has one power supply installed. The other location has a blank-off plate installed. To install an additional power supply, remove the blank-off plate, line up the supply in the mounting rails and slide into place. Press firmly on the front of the supply to properly seat the supply into the rear connector (refer to Figure 21).

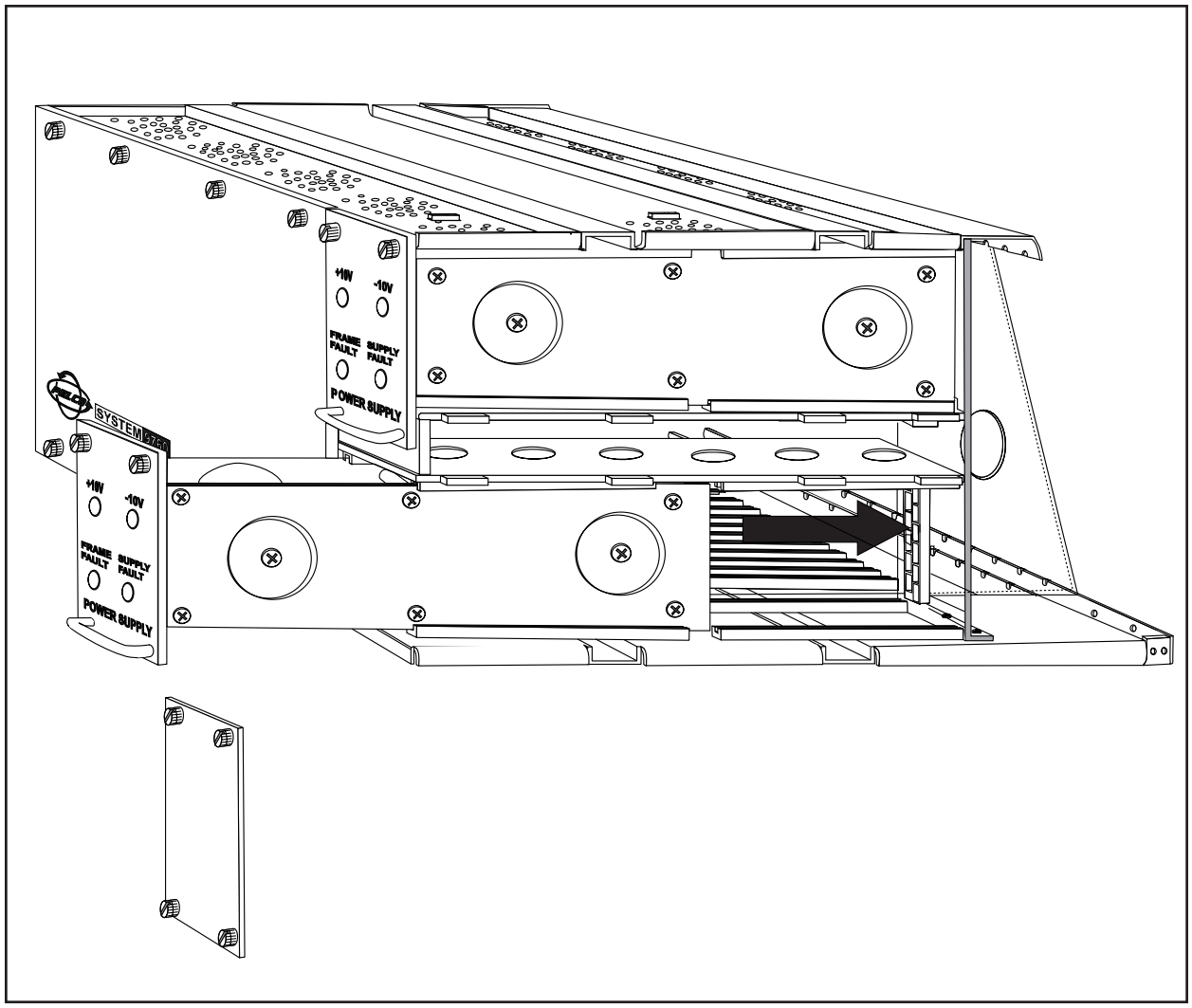


Figure 21. Power Supply Installation

Setting the Jumper on the Power Supply (Beeper Enable)

Located on the power supply is a three-position header that allows the user to enable/disable the audio beeper, which also is located on the power supply. The beeper operates in conjunction with the fault LEDs located on the front panel. Refer to Figure 22 for the location of X5 and how to set the jumper.

Power Supply LEDs

Each power supply is equipped with four LEDs labeled +10 V, -10 V, Frame Fault and Supply Fault. If the unit is operating properly, the +10 V and -10 V LEDs will be illuminated. Refer to Table H in Section 3.4.1 for a complete description of the power supply LEDs.

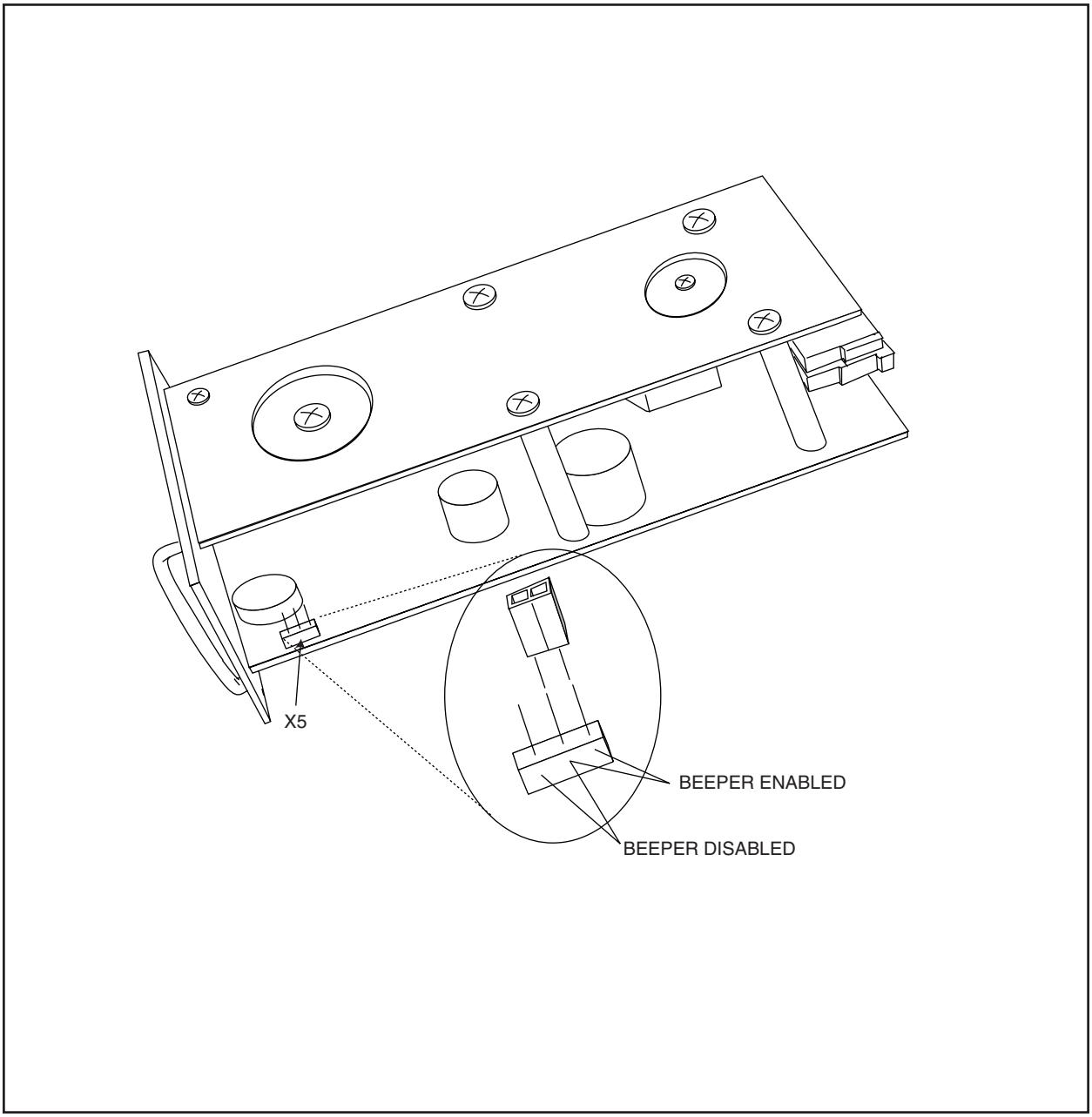


Figure 22. Jumper Position on Bottom of Power Supply

NOTE: *Make sure the selected location has adequate power available. The unit operates on either 120 VAC or 230 VAC input power.*

The matrix bay communicates with the Controller via RS-422 communications and therefore can be installed up to 4,000 feet (1,219.2 meters) away from the Controller. Determine where the matrix bay is to be located and follow the mounting and wiring instructions below.

3.1 MOUNTING INSTRUCTIONS

The matrix bay mounts in a 19-inch rack using standard mounting hardware and occupies 6 RU (10.5 inches) of vertical space. Place the matrix bay in the desired location and secure properly.

The matrix bay is designed for low power consumption and therefore has no internal fans. If mounting several matrix bays together in the same location or if installing in high temperature environments, it is highly recommended that you separate the units by at least 1 RU (1.75 inches). In high temperature environments, it also may be necessary to provide forced air cooling. Contact Pelco for additional information.

Once the unit has been secured into the equipment rack, remove the front panel of the unit to gain access to the circuit cards. Ensure each card is firmly seated in the frame.

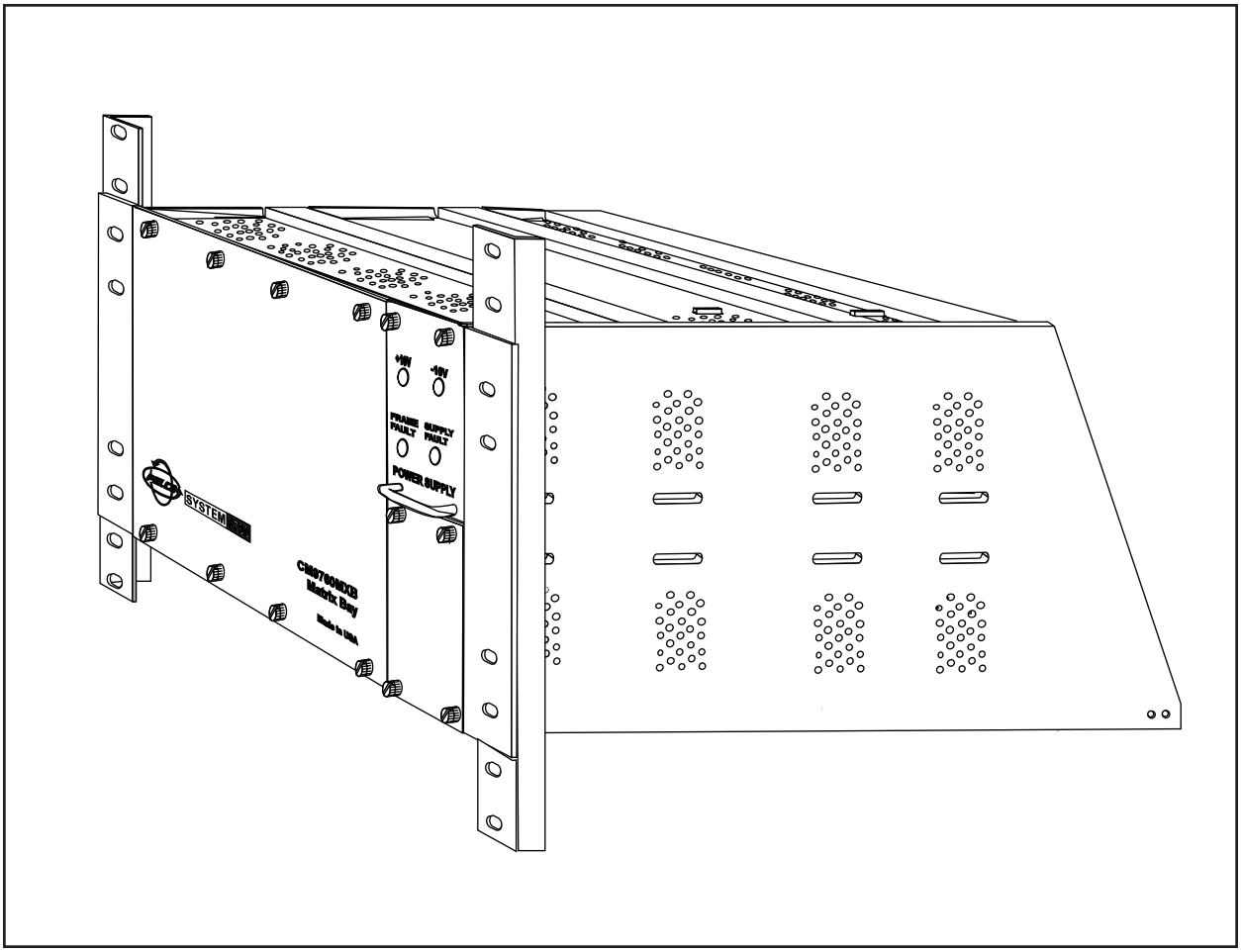


Figure 23. Mounting the Matrix Bay

3.2 CONNECTING POWER TO THE MATRIX BAY

WARNING: *Always replace blown fuses with fuses of the same rating. Failure to do so could result in serious damage to the unit.*

The matrix bay is shipped from the factory configured for the correct input power. The unit provides two separate power input receptacles, one for each power supply. Each receptacle is equipped with its own On/Off switch and fuse assembly. In addition, each fuse assembly also provides a spare fuse. Refer to Figure 24. To remove the fuse assembly, first remove the power cord from the receptacle and, using a small screwdriver, pry the fuse holder out of the socket. The complete fuse assembly comes out of the unit. Replace the fuse using a 1.6 ASB fuse. If using the spare, make sure to replace the spare with one of the same rating.

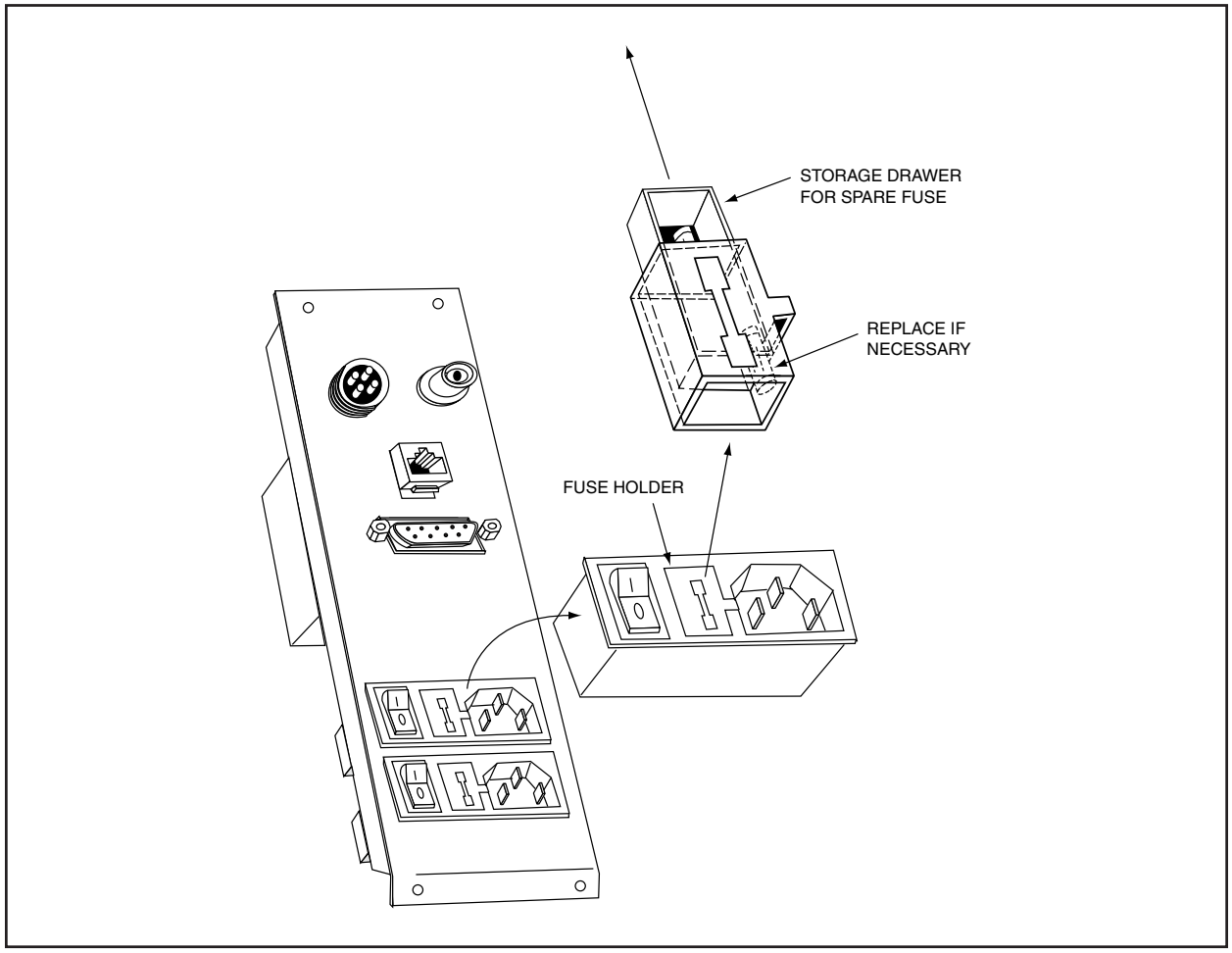


Figure 24. Replacing Power Supply Fuses

3.3 CONNECTING THE MATRIX BAY TO THE CONTROLLER

As illustrated in Figure 25, the female RJ-45 SerCom data port connector labeled RS-422 on the rear of the matrix bay connects to a female RJ-45 SerCom port (RS-422) on the rear of the CM9760-CC1. A 10-foot (3.05 meters) reversed cable is supplied to connect the matrix bay to the CC1. If you must create a longer cable, it is recommended that you use a 24-gauge twisted-pair cable.

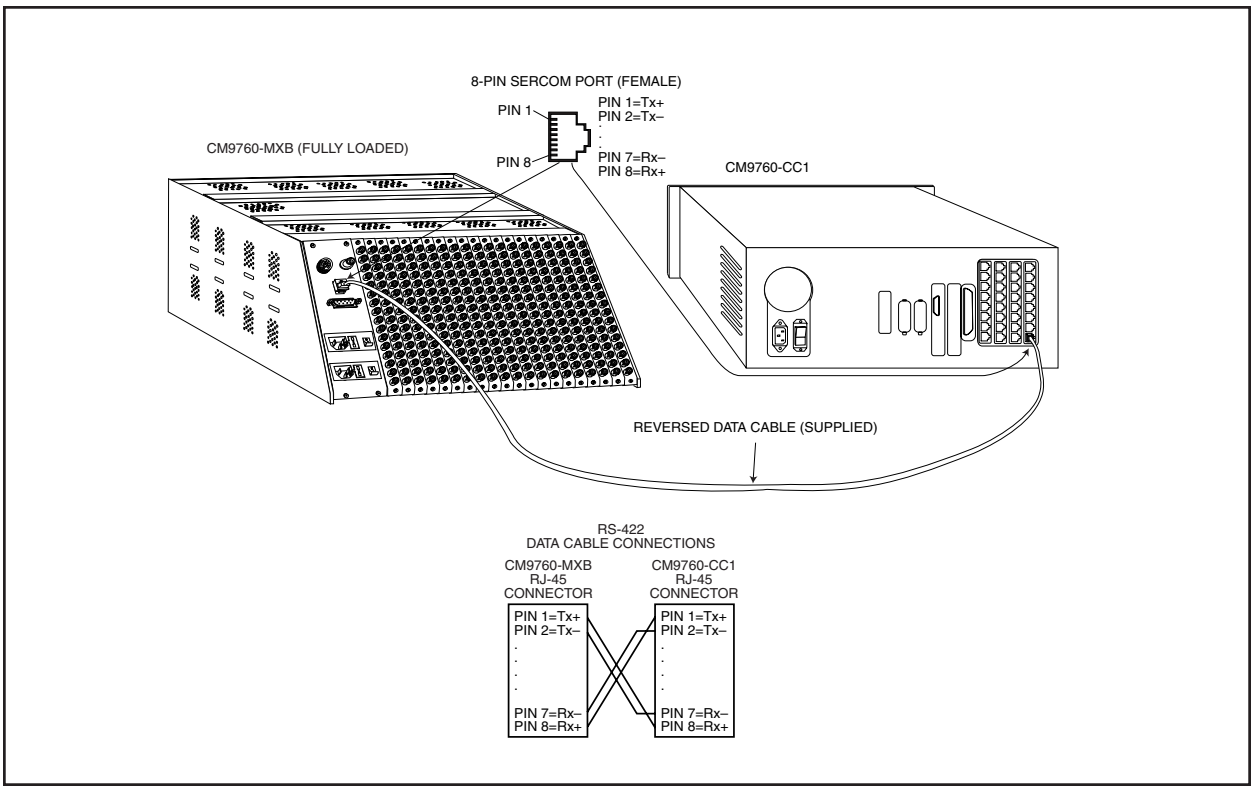


Figure 25. Connecting the Matrix Bay to the CM9760-CC1 Controller

3.4 LED DIAGNOSTICS

Each component installed in the matrix bay is equipped with diagnostic LEDs (most of which have already been mentioned) to aid in system troubleshooting. All LED assignments are repeated below (for convenience) in Table G.

3.4.1 Performing a Diagnostic LED Check

Prior to connecting any video input or output to the matrix bay, it is recommended that you first power up the unit to ensure the system is operating properly. Refer to the following checklist to ensure the matrix bay is operating correctly at this time.

1. Apply power to the unit.
2. Ensure both power LEDs on the supply (or supplies) are illuminated.
3. Ensure both the Frame Fault and the Supply Fault LEDs are OFF.
4. Remove the front panel and check the power LEDs on each of the Video Input/Output Cards. Both LEDs should be illuminated. If any board has a problem, remove the board(s) and inspect the fuses. Replace fuse (if necessary) and reinstall into the frame. If the condition continues, replace the defective board with a known good board.
5. Ensure all Comm Fail LEDs are OFF. If this LED is ON on any Input card, reseat the board. If the condition continues, replace with a known good board. If all the Comm Fail LEDs are illuminated, press the reset button located on the Output card. If the problem continues, replace with a known good board. If the LED is illuminated on the Output Card only, check the communications to the CM9750 Controller.
6. If everything is OK, install all video inputs and outputs as described in paragraph 3.5.

Table G. Matrix Bay LED Assignments

Video Output Card LEDs		
LED	COLOR	WHEN LED IS ON
DS1 to DS3	Amber	Always ON, No assignment
DS4	Green	–10 VDC is OK
DS5	Green	+10 VDC is OK
DS6	Red	Communications failure with the CM9760-CC1
Video Input Card LEDs		
LED	COLOR	WHEN LED IS ON
CR1	Red	Communications failure with the CM9760-CC1
CR2	Green	+10 VDC is OK
CR3	Green	–10 VDC is OK
Power Supply Module LEDs		
LED	COLOR	WHEN LED IS ON
+10 V	Green	Normal Operation
–10 V	Green	Normal Operation
Frame Fault	Red	(flashing) Failure of one or more cards
Supply Fault	Red	Failure of associated power supply

3.5 CONNECTING VIDEO INPUTS/OUTPUTS

NOTE: *When wiring inputs it is always good installation practice to label each video input. This can save a considerable amount of time should troubleshooting be required.*

All video inputs and monitor outputs are connected to the Rear Panel BNC Cards. Be sure each connection is secure and that the connectors are installed properly. When connecting the inputs and outputs to the rear panels, allow enough slack in the cable to act as a strain relief.

4.0 FUNCTIONAL CIRCUIT DESCRIPTION

The matrix bay communicates with the Controller via an RS-422, full-duplex, asynchronous communications interface and performs all video switching functions as directed from the Controller.

Refer to Figure 26 for a block diagram outlining the discussion in the next few paragraphs. Refer to Figure 27 for a more graphical representation of the same thing. The video signal enters the matrix bay through the Rear Panel BNC Card (Input) where it is terminated with 75 ohms. The signal then proceeds to the Video Input Card via the input buffers and is then directed to the 16 x 16 crosspoint switch. Operation of the crosspoint switch is controlled by the Video Output Card.

The signal leaves the Video Input Card and is sent to the Video Output Card via the video bus. When received by the Video Output Card, the signal is processed by the Output Titling Module where the DC level of the signal is restored and the titling message is inserted. The edited video signal leaves the matrix bay through the Rear Panel BNC Card (Output).

The video signal path is controlled by the microprocessor located on the Video Output Card. The Video Output Card has full control of all Video Input Cards. The basic functional group is essentially a crosspoint switch with a variable number of inputs and 16 outputs. The number of inputs can vary from 16 to 256, in 16 input increments. The functional group (matrix bay) can be used as a stand alone routing switcher or it can be connected to other matrix bays to create a larger system.

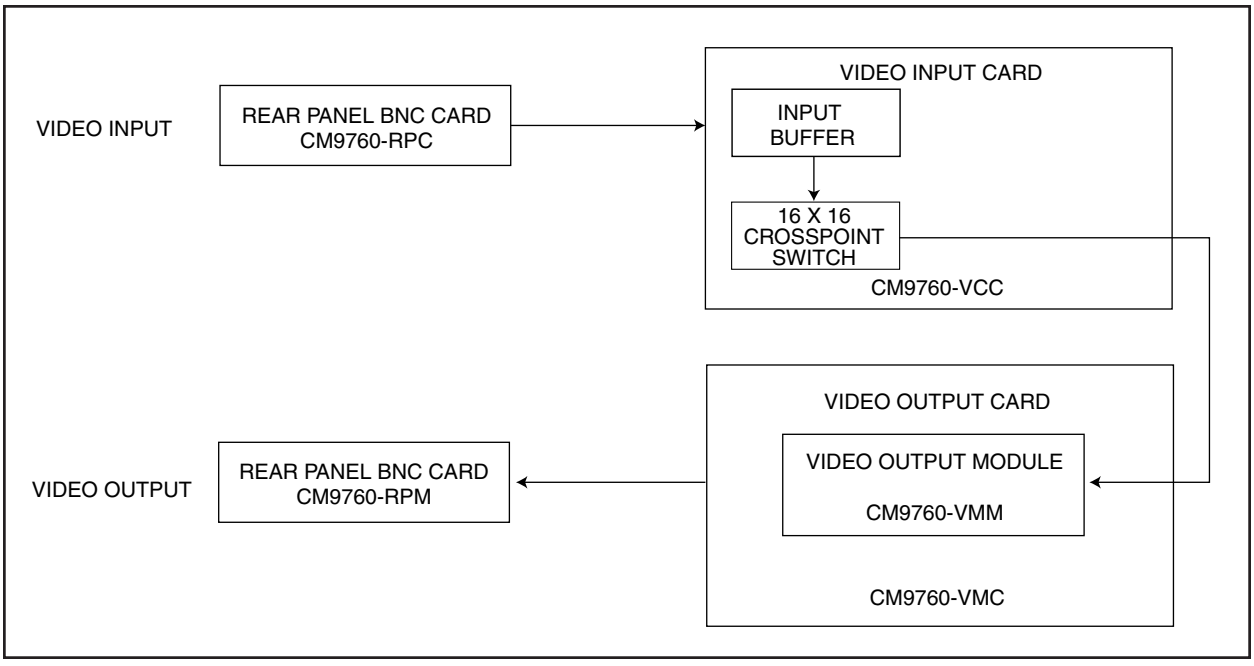


Figure 26. Video Signal Flow–Block Diagram

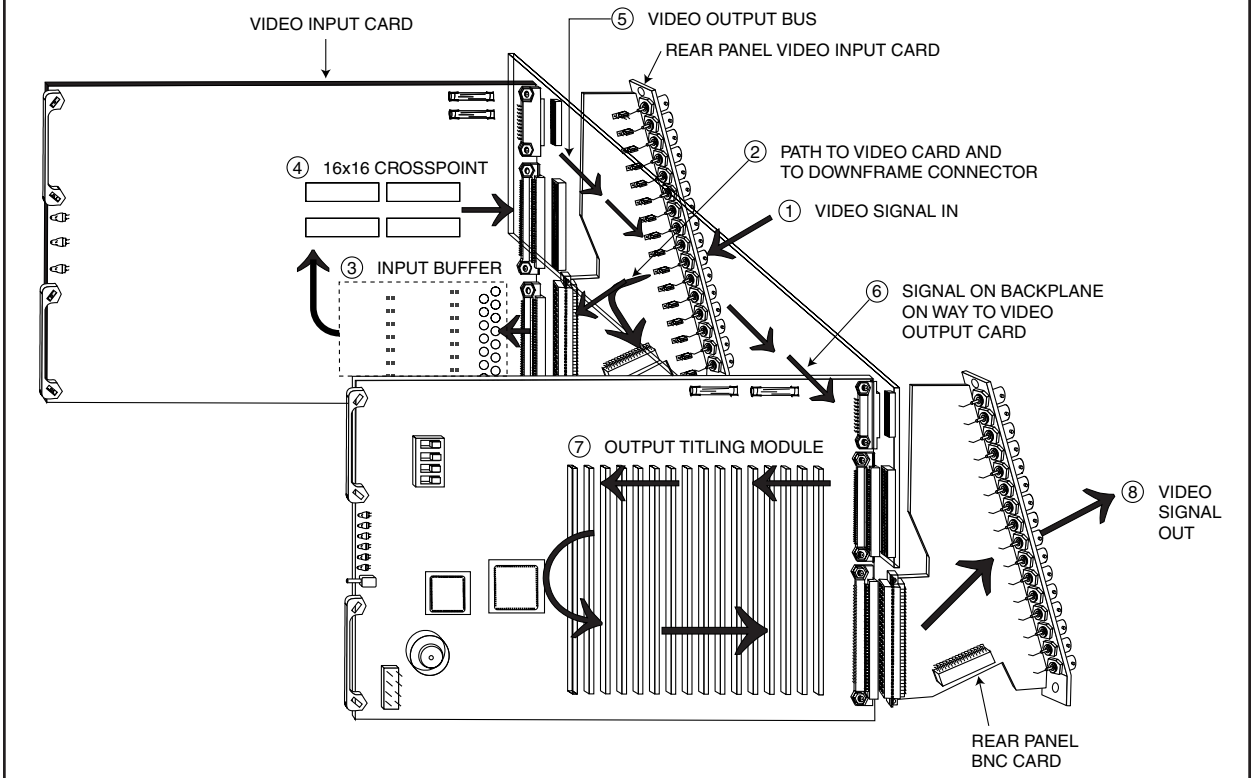


Figure 27. Video Signal Flow–Graphical Representation

When either more cameras and/or more monitors are needed than can be accommodated by one matrix bay (256 x 16), then one must resort to either downframing (to increase the number of monitors available for **OUTPUT**) or to sideframing (to increase the number of camera **INPUTS** available).

In order to accommodate these larger systems, additional matrix bays will need to be installed and it is important to note that this requires that the physical location of additional matrix bays be within the same rack if you are increasing Output capabilities, since the expansion requires that the bays be hooked together in a vertical manner or "downframed". For downframed configurations, leave 1 RU (1.75 inches) of space between each matrix bay. Similarly, adding Inputs requires that additional matrix bays be located in nearby bays since the expansion occurs in a horizontal manner called "sideframing". We shall discuss each configuration separately and follow that with a discussion of more complicated configurations which involve using both framing methods in a multi-bay configuration.

Most of the symbolic references and conventions we shall use in our discussion of system configurations is represented in Figure 28. Items not listed will be labeled within the illustration itself.

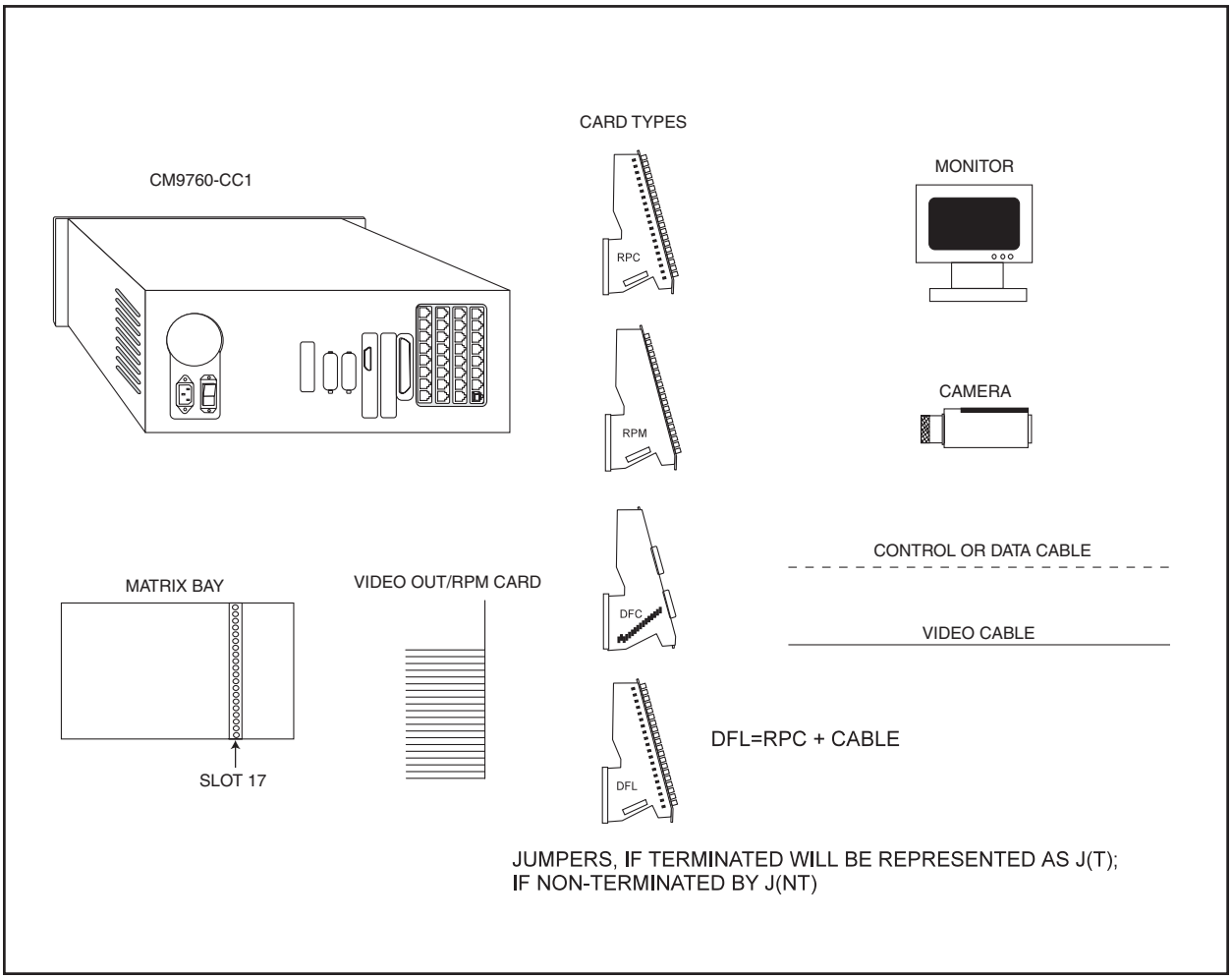


Figure 28. System Configuration–Reference Conventions

5.1 DOWNFRAMING

The matrix bay can be set up in multiple configurations. When limited to 16 monitors or less, the rear of the bay will be populated by two type of cards: the CM9760-RPC (Rear Panel BNC card for video inputs, usually a Camera) and the CM9760-RPM (Rear Panel BNC card for Monitor output). These cards are different and are not interchangeable. In addition, on single bay configurations, the jumpers on the CM9760-RPC cards will be configured for termination–a necessary condition for operation (refer to Figure 16). A single bay configuration is illustrated in Figure 29.

When it becomes necessary or desirable to downframe, several different scenarios, each with different card populations, can occur.

Downframing requires that the Inputs of the first bay be electronically reflected or mirrored in the video circuitry of all other bays downframed from the first. This will increase, by 16, the number of monitors available for output for each additional bay downframed.

There are two different available downframe cards, both of which have been discussed previously (refer to Section 2.2.4). One card is the CM9760-DFC (the “no looping” downframe card) and the other is the CM9760-DFL (the “looping” downframe card).

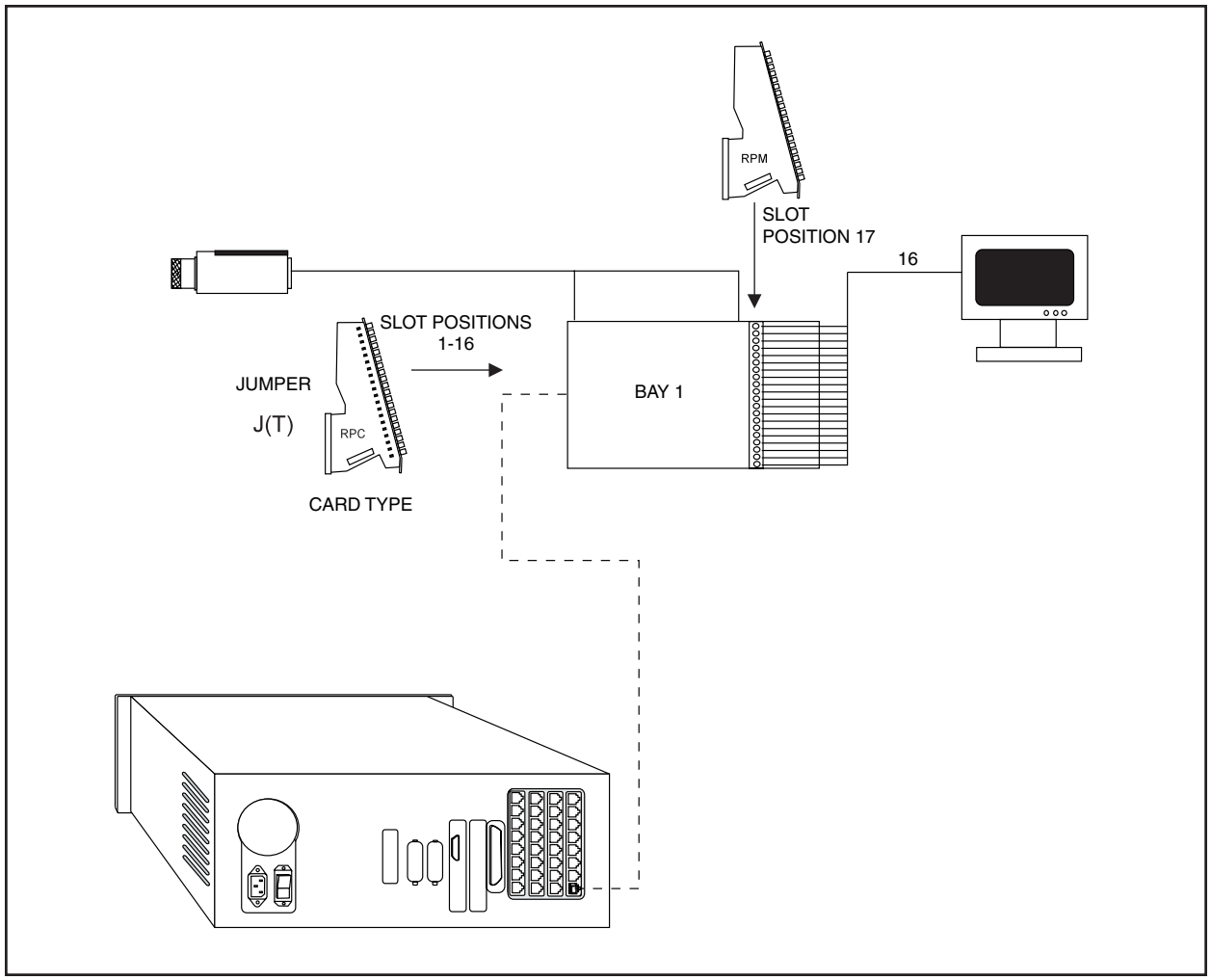


Figure 29. Single Bay Configuration–256 Cameras x 16 Monitors

Downframing requires that the Video Inputs of the first bay be connected to the video circuitry of the bay immediately below it. If you remember the physical layout of the CM9760-RPC card, you will recall that the 16 video inputs to the card are fed not only to the large, front loaded Video Input Card but are also wired to an output connector located near the bottom edge of the card. This connector is cocked at an angle to the bottom matrix bay rear opening for easy access. A downframe cable is used to connect the bottom connector of the RPC card to either a DFL (looping) card or a DFC (non-looping) card.

If you are downframing to only one bay, this bay can be populated with DFL or DFC cards. You will need as many DFL or DFC cards as there are RPC cards in the first bay. Figure 30 represents downframing with a 256 x 32 multiple matrix bay configuration that uses DFL cards in the second bay. In this case, the video circuitry between the first and second bay are tied together, slot for slot, via their bottom connectors. The termination jumpers on the DFL card in the second or last bay are in the terminated position only if the loop outs are not connected; the RPC cards in the first bay are unterminated. In general, termination jumpers on the last downframed card in a series must be set to the termination setting; however, since an individual termination jumper exists for each video line, you can route individual video signals through the DFL card and loop to a monitor output and terminate at that point if you wish. As a result of downframing operation just described, the Inputs in the first bay become available to the downframed bay and any input can now be switched to the additional 16 monitor outputs created there, increasing the total number of monitor outputs.

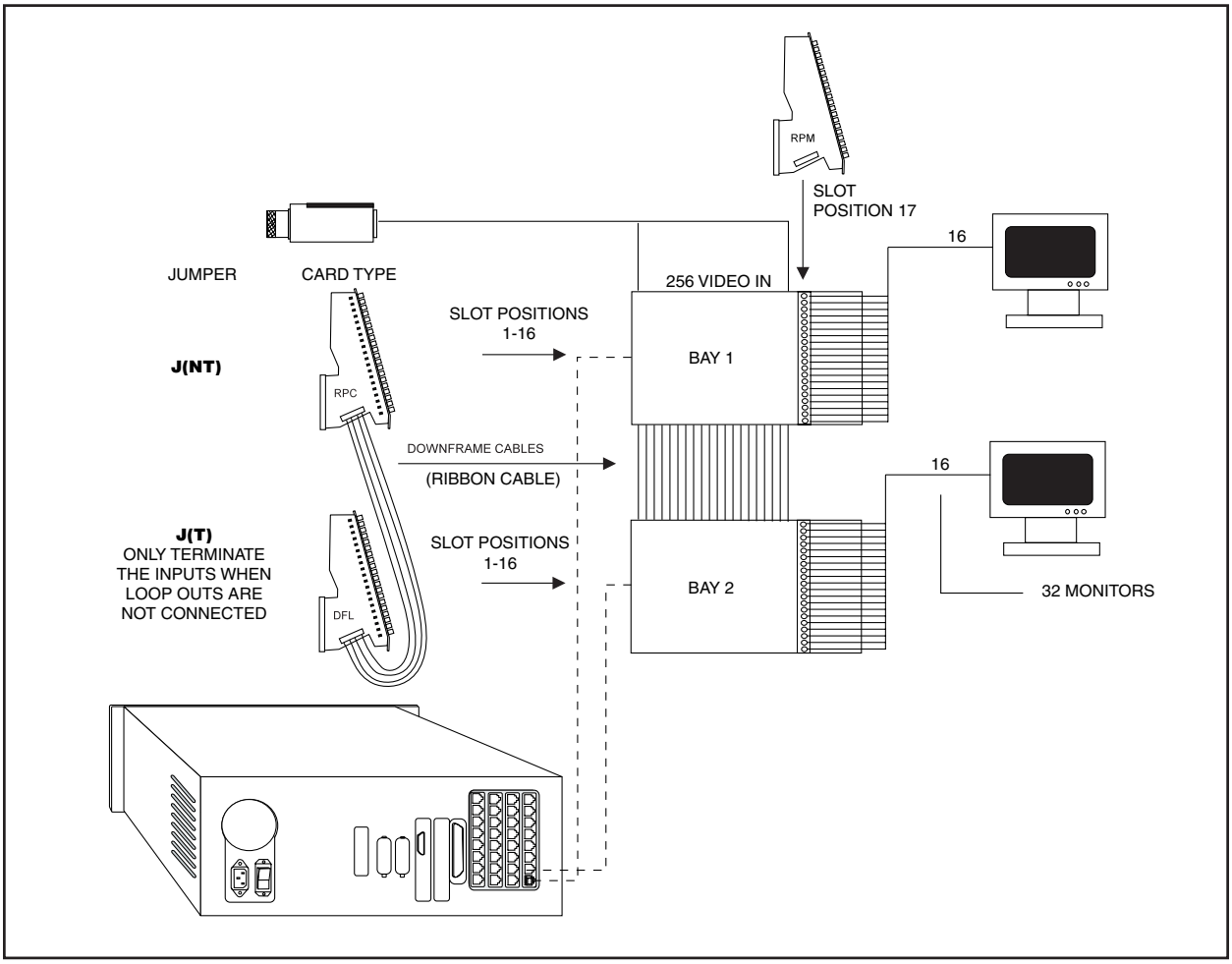


Figure 30. Single Bay Downframe–256 Cameras x 32 Monitors

When downframing more than one bay, the intervening bays between the first and the last contain DFC cards. The last bay in the downframe configuration can contain DFC or DFL cards. Figure 31 illustrates a downframe configuration that uses DFC cards rather than DFL cards in the last bay.

In Figure 31, note the following:

- The termination jumpers on the RPC cards in the first bay (bay 1) must be in the unterminated position.
- The termination jumpers on the DFC cards in the intermediate bays (bays 2-7) must be in the unterminated position.
- The termination jumpers on the DFC cards in the last bay (bay 8) must be in the terminated position.

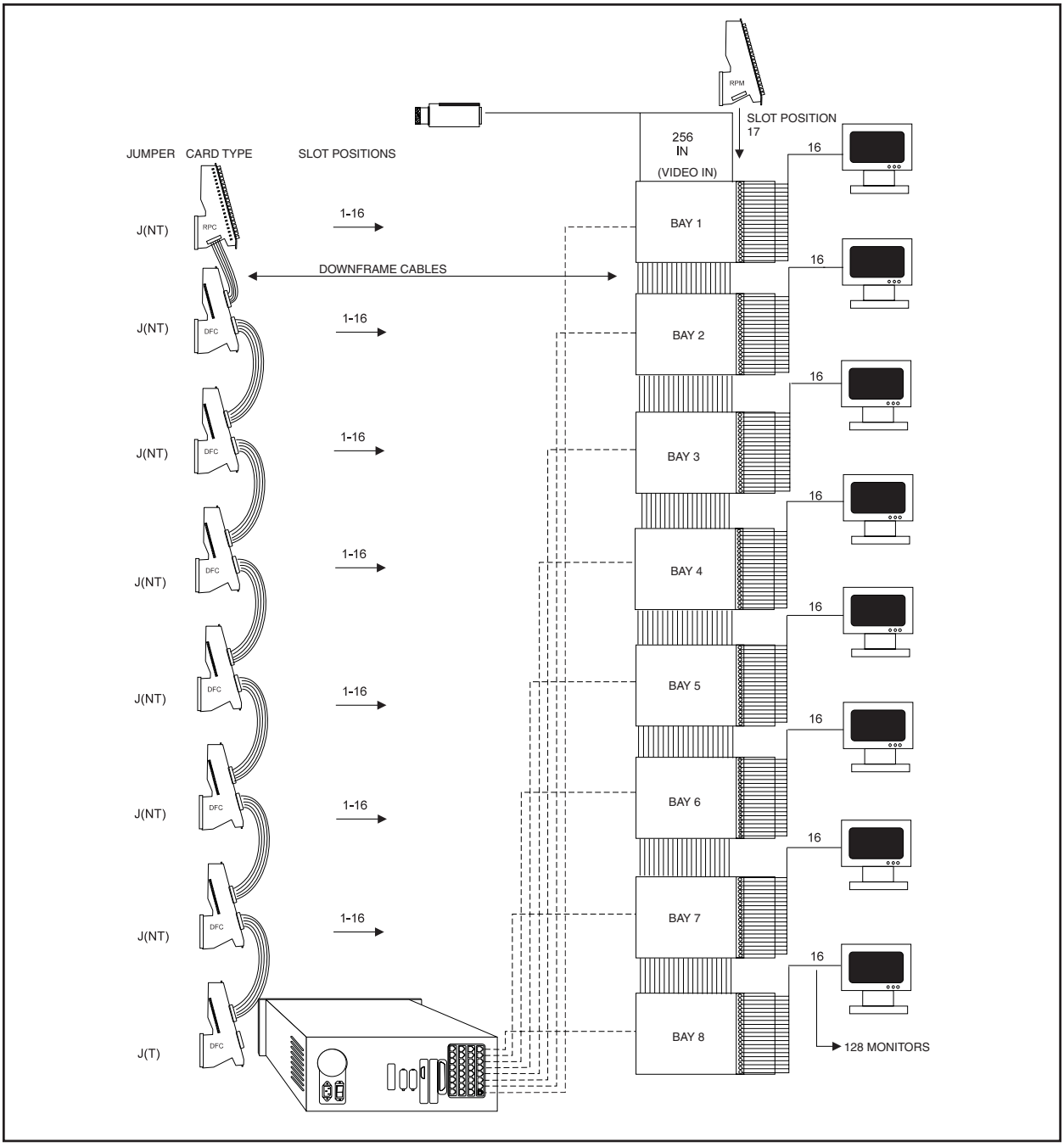


Figure 31. Downframe Configuration–256 Cameras x 128 Monitors

5.2 SIDEFRAMING

Factory Configured Systems

When the number of video inputs required exceeds 256, then a method known as sideframing is used to increase camera input population. This involves tying the monitor outputs of the first bay to the first 16 video inputs of the sideframed bay. Figure 32 illustrates one matrix bay sideframed to another.

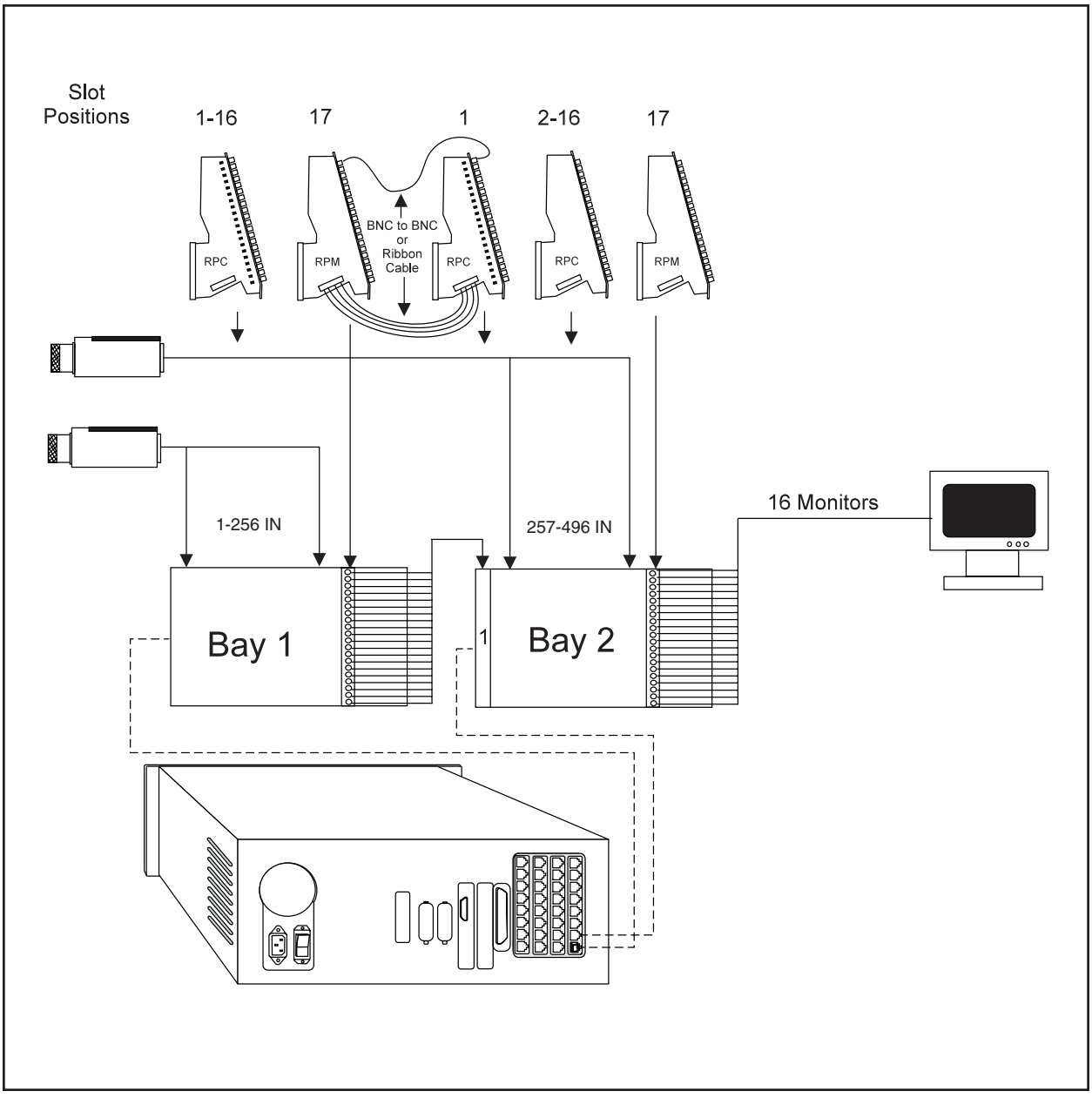


Figure 32. Single Sideframing–496 Cameras x 16 Monitors

If more video inputs are required than are available with two matrix bays, then, in a similar manner, additional bays can be sideframed up to a maximum of eight (physically there are nine bays; eight are sideframed to the last bay which is referred to as the OUTPUT bay). Figure 33 illustrates three sideframed matrix bays and one output bay. When you order an entire system from the factory, all the matrix bays with their associated boards and connecting cables are tested and properly configured for your system.

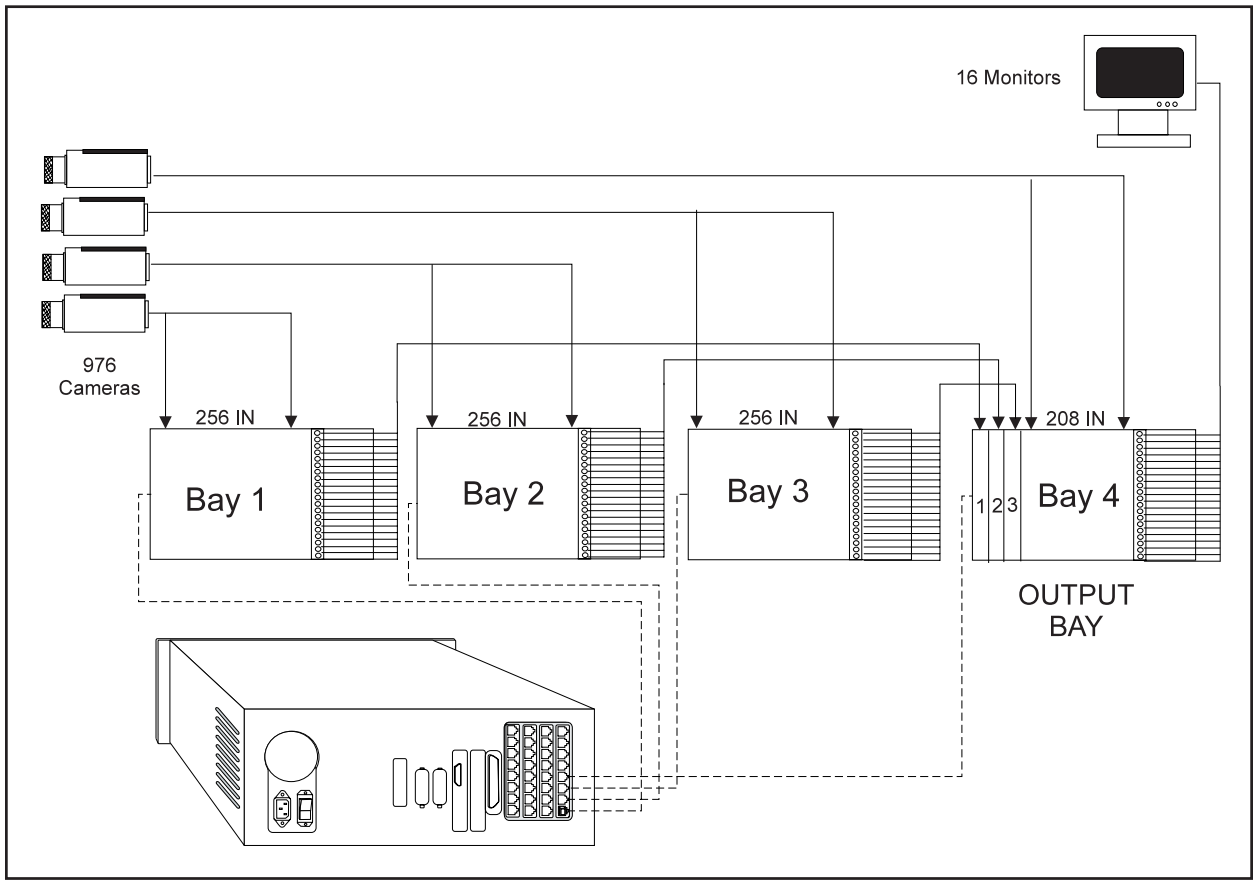


Figure 33. Sideframe Configuration–976 Cameras x 16 Monitors

A Word About Adding Additional Matrix Bays to Existing Field Installations

If expanding your existing system by sideframing, decouple the monitors connected to the original bay (leaving the cables connected to the output card, if possible) and connect these open cables to the first 16 video inputs of the new bay, having it now become the OUTPUT bay. *This way, the already programmed video inputs for the original bay can be left alone and all you have to program are the new video inputs.* The same type of scenario applies to any additional matrix bays that are to be sideframed. As a general rule, to minimize programming time as new bays are added to a system configuration, they should be installed and configured as the OUTPUT bay. For example, to continue adding bays to the two bay-configuration just discussed, decouple the monitor outputs of the existing OUTPUT bay (second bay) and input them to the second 16 video inputs of the new bay which now becomes the OUTPUT bay (third bay). Also detach the monitor out cables of the original bay from the first 16 inputs of the second bay and route them to the first 16 inputs of the new bay. Doing this, minimizes the amount of reprogramming within your configuration.

5.3 DOWNFRAMING/SIDEFRAMING

Combined Sideframing and Downframing

Figure 34 illustrates a matrix bay configuration containing sideframed and downframed bays.

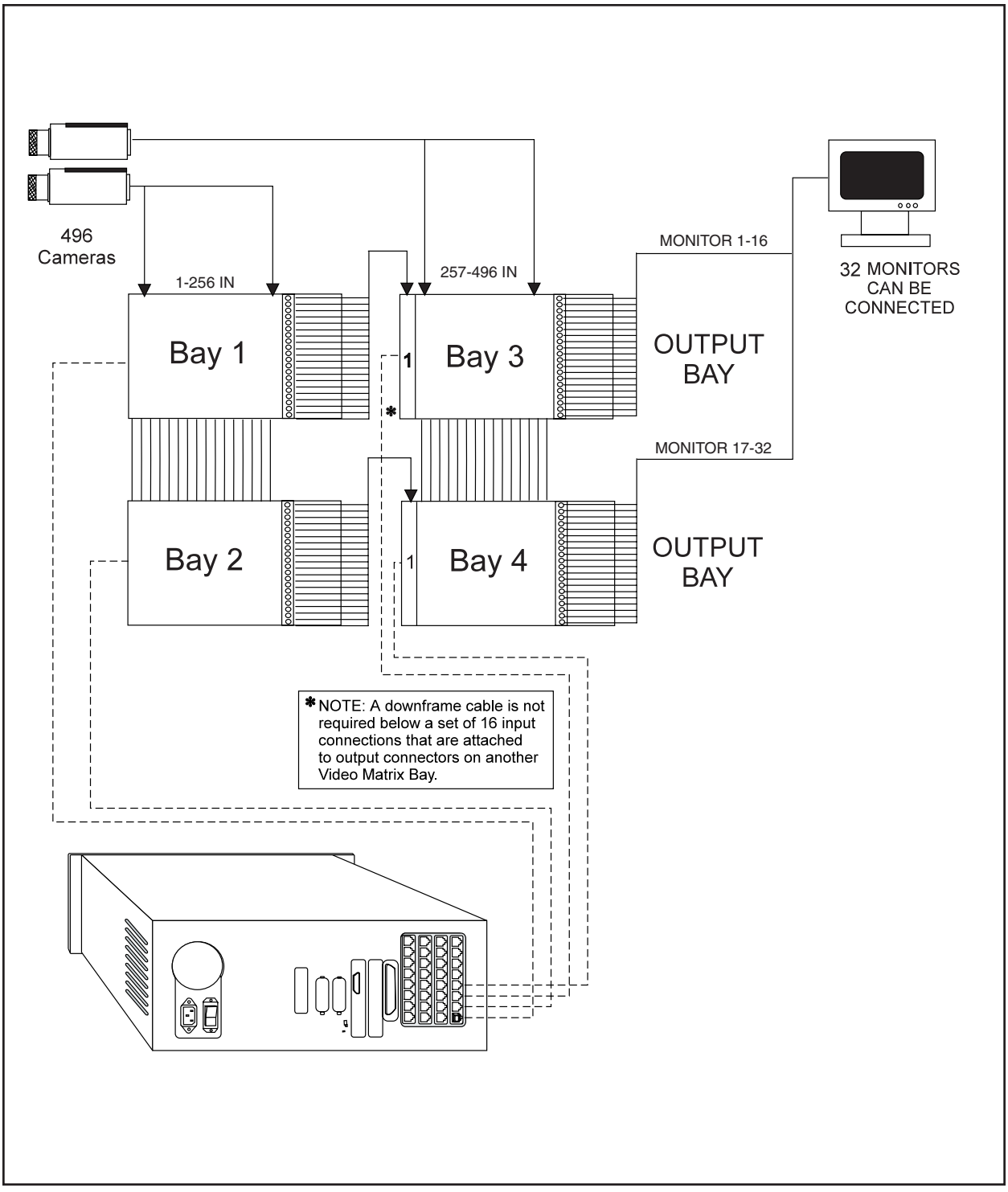


Figure 34. Sideframe/Downframe Configuration–496 Cameras x 32 Monitors

Figure 35 illustrates a sideframe/downframe configuration that provides support for 976 cameras and 128 monitors. The configuration consists of a total of 32 matrix bays.

Figure 36 illustrates a sideframe/downframe configuration that provides support for 2048 cameras and 128 monitors. The configuration consists of a total of 72 matrix bays.

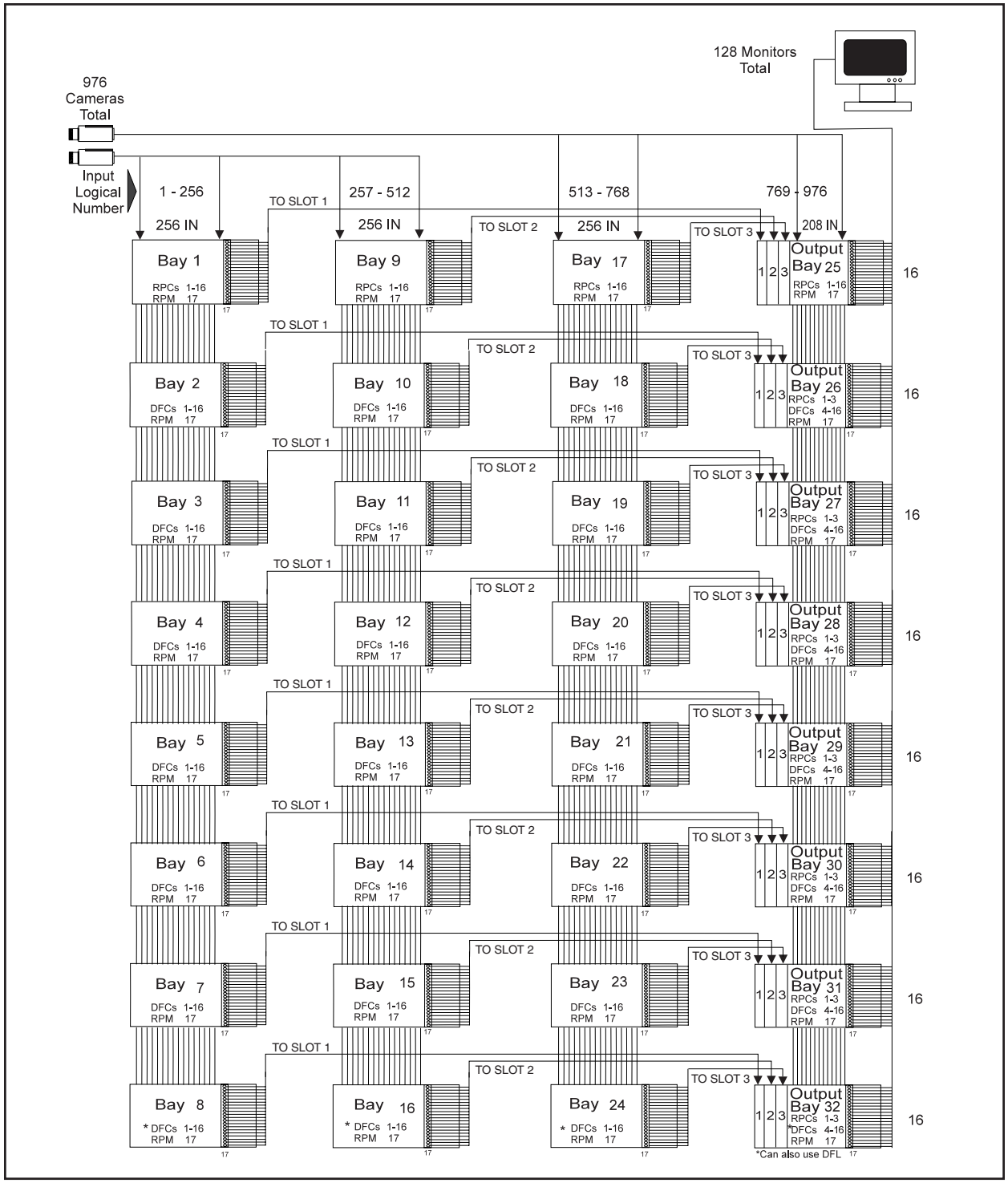


Figure 35. Sideframe/Downframe Configuration–976 Cameras x 128 Monitors

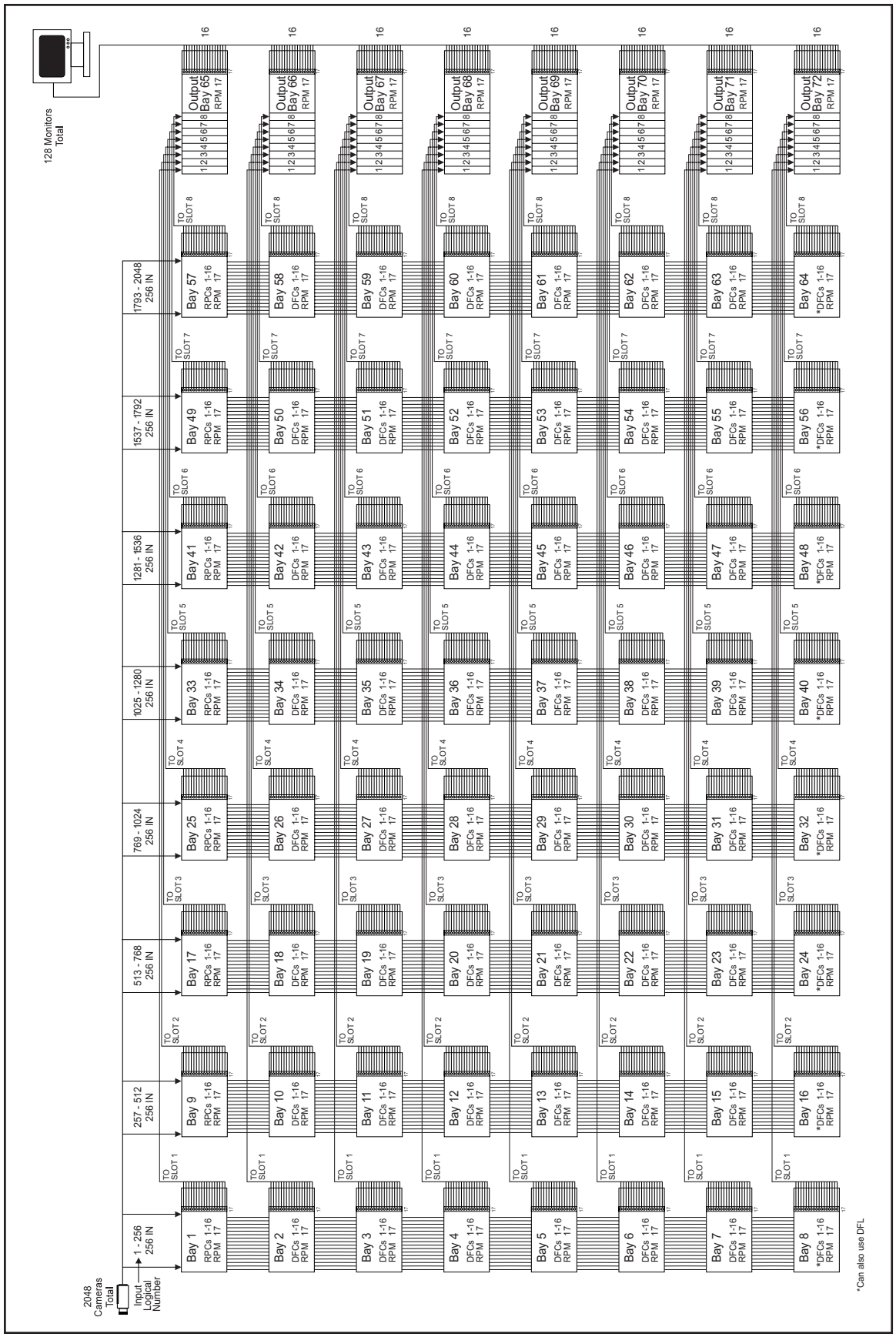


Figure 36. Sideframe/Downframe Configuration–2048 Cameras x 128 Monitors

6.0 PROGRAMMING NOTES–ODDS AND ENDS

The following programming notes are brief and are put here only as an indication of the areas of programming that affect the matrix bay or as a “memory check” for those already familiar with programming. The following should not be used as a substitute for the programming manual itself, which should be consulted whenever any programming changes or additions of substance are made.

Video Loss

Alarm and video modes of Video loss will not be activated unless the fourth switch position of the S2 switch on the Output card for the matrix bay in which the associated camera is located is set to ON. It is-by default-in the OFF position.

Video Matrix Bay Numbering (Sideframing)

The Current operating software allows sideframing, of up to eight additonal matrix bays besides the first, making the total available input capacity of sideframed matrix bays, 2048. This input capacity increases via the networking of multiple systems. When programming the COMMS Setup dialog box (.SCP file) as part of programming your configuration files, there is an entry field for Equipment numbers to be entered for **all** devices tied to SerCom ports on the CM9760-CC1. The matrix bay is no exception; therefore, each matrix bay used in a system must be attached to a communication port on the CC1. Whenever only “one” video matrix bay is attached to a CC1, you must assign an equipment number of 2 to the port where it’s connected. If another bay is attached to a different port on the CC1 and is the first sideframed bay, the port where its connected is assigned an equipment number of 12 in the equipment field. Likewise, a second and third sideframing bay are assigned Equipment Numbers of 22 and 32, respectively.

Adding a Video Matrix Bay Directly to an Existing System

The following is a quick reference for using 9760 Configuration Setup files to add a matrix bay to a 9760 System.

1. Click on the Setup icon on the toolbar so that the Configuration files dialog box appears on the screen (refer to Figure 37).

2. Select the node you wish to edit.

3. Click on “Setup Files” and the Setup File dialog box should appear on screen; select COMMS (refer to Figure 38).

4. In the Comms Setup dialog box that appears on screen, type the appropriate Equipment number in the Equipment Number Box (in our example, we entered the number 2), depending on what you plan to do with the matrix bay (i.e., downframe, sideframe).

5. Type in the baud rate and parity.

6. Enter any descriptive information you wish and click on Save.

7. Make sure directly and indirectly associated setup file Dialog boxes are also configured to reflect the changes made. In most cases these would be Camera

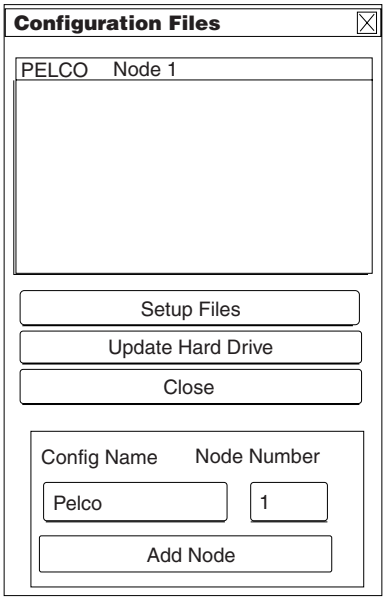


Figure 37. Setup File Dialog Box with Comms Tab Opened

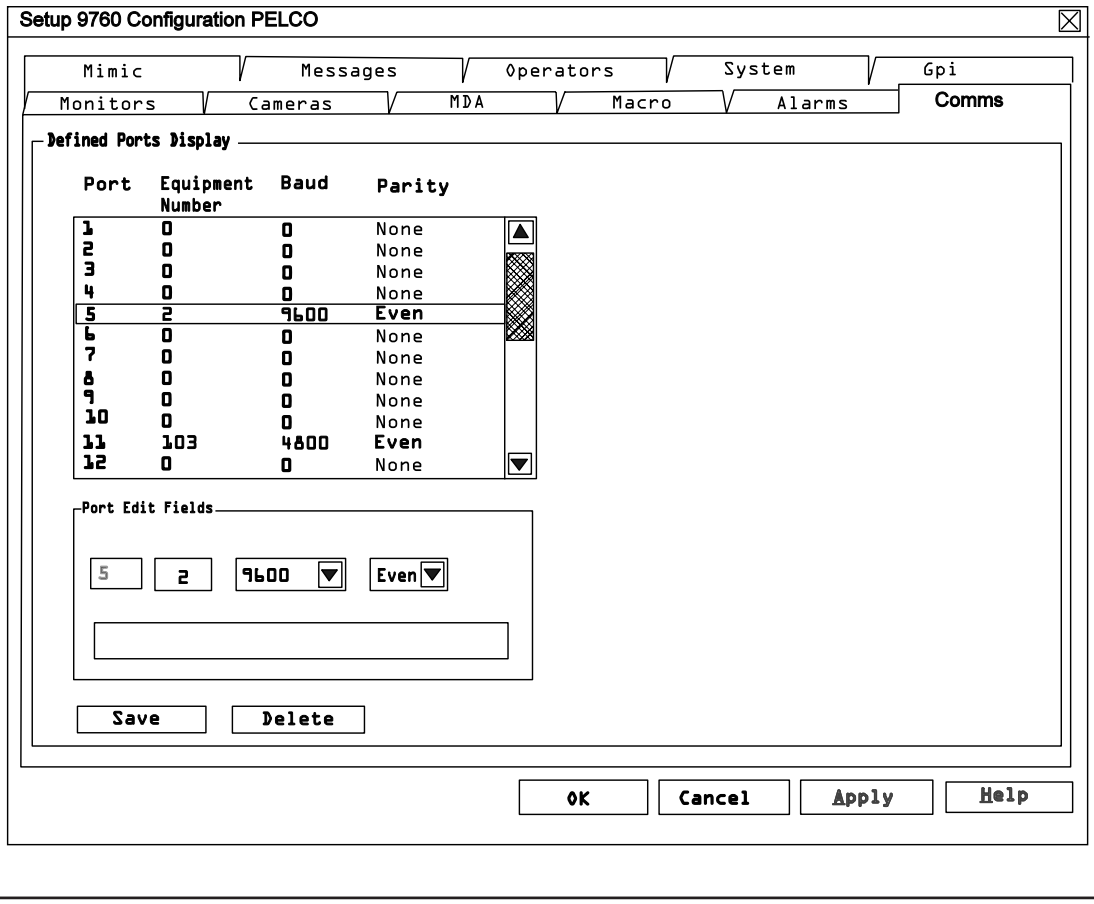


Figure 38. Configuration File Dialog Box

Logical Numbering

It can be difficult and confusing to track large numbers of video input and output signals in a 9760 system. The "logical number" programming field that exists within the input/output configuration files of affected devices exists as an aid to minimize this problem for the programmer as well as for the operator of the system. A logical number is a user selectable, variable number, and is always associated with an actual physical input, while physical input numbers, in turn, represent an actual BNC input on the rear of the matrix bay and each input has a given, fixed number associated with it. However, *within the programming environment and at the operator level*, it is the **logical number** that is used for reference; therefore, a judicious choice for logical numbers can help minimize camera/monitor tracking.

Example 1:

As an example of "logical number" use, let's assume that on each floor of a 5-story building there exists a camera population ranging from a minimum of 5 to a maximum of 10 cameras. The camera population might be as follows:

Floor 1: 5 Cameras
Floor 2: 7 Cameras
Floor 3: 10 Cameras
Floor 4: 6 Cameras
Floor 5: 5 Cameras

Can logical numbers be assigned to each of the camera inputs connected to the matrix bay in the above list a way that would help the operator to track cameras location?

Let's assume that logical numbers for the above are assigned according to the following rules:

(1) Each logical number that references a camera input consists of three digits.
(2) The first digit gives the floor level of the camera location.
(3) The next two digits identify the camera location on the referenced floor according to some previously agreed upon sequence.

Looking at floor 4, for example, the physical inputs for the 6 cameras might be assigned sequential logical numbers 401, 402, 403, 404, 405 and 406; however, if one wished to allow for future expansion between existing camera locations, the assigned logical numbers might be assigned with a 5 unit spacing between numbers and end up with assigned logical numbers of 401, 405, 410, 415, 420, and 425, respectively. To put a different twist on logical number assignment, let's assume that each floor covered a large area, then our "rule three" above might be modified to let the last two digits represent a division of the floor area into zones; with the second digit being one of 9 possible zones and the third digit being 1 of 9 possible cameras within any given zone. The point of all this is, is that there are many and varied ways to assign logical numbers-it just should be done in a way that makes sense for your installation.

Example 2:

At other times, it might be useful to define the logical number of a camera input as being the same as that of the actual physical, fixed input that the camera is attached to. Since physical inputs and their associated numbers are fixed, it seems like a natural choice, under some circumstances, to use this scheme. Figure 39 shows a camera file set up where the numbers entered for the physical input and the logical field are the same.

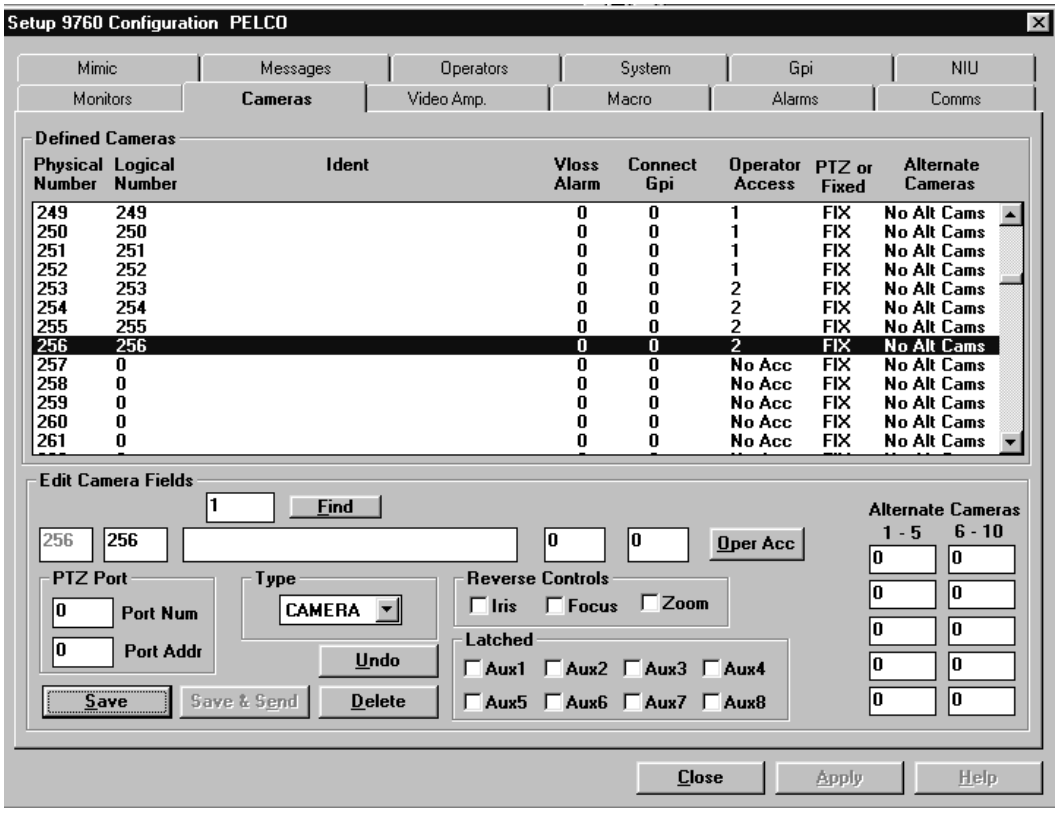


Figure 39. Camera Files and Logical Numbers

This happy state of sequential ordering breaks down if an additional bay is added (sideframed) to increase camera inputs (refer to Figure 40). This is because the 16 video output cables (from the CM9760-RPM cards) of the original bay are connected to the first 16 video inputs of the sideframed bay (CM9760-RPC cards). These 16 inputs, which are still physical inputs (but dedicated to another purpose) are not available as independent physical inputs at the operator level and in the logical field associated with these inputs, a “0” must be entered.

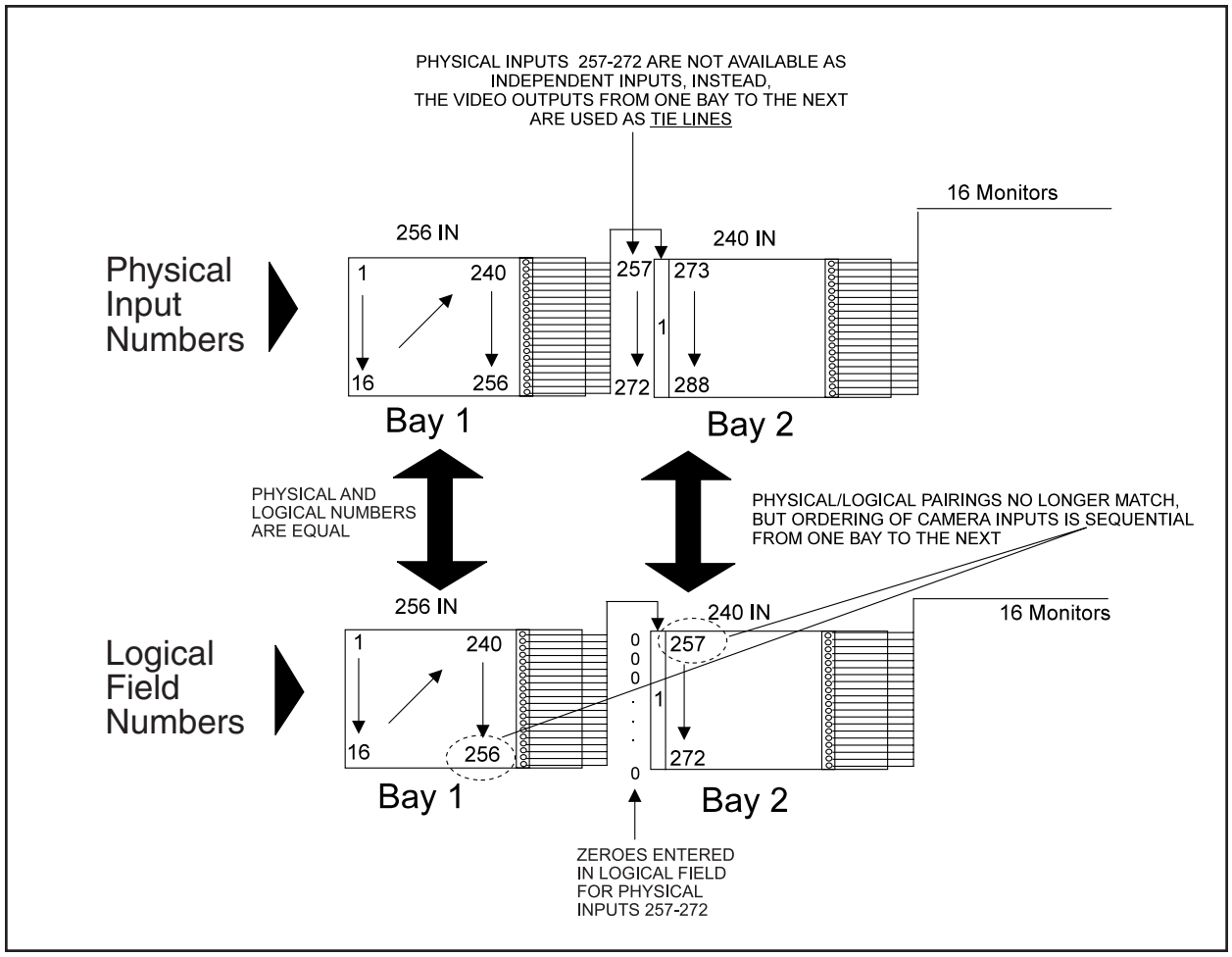


Figure 40. Physical and Logical Numbers Compared

The next 16 inputs of the sideframed bay, however, are available for programming at the operator level and logical numbers can be assigned; so what number should we use? Using 273 in the logical field would introduce a numbering gap of 16 in the sequential ordering of camera inputs (the last logical/physical number pairing was 256 in the original matrix bay). The best solution is to ignore the gap and pick up the count at 257 (refer to Figure 41). This, at least, preserves the sequential ordering of camera numbering. It should also be pointed out that if sideframing had been necessary in our first example, then the comments made here about logical numbering would also apply.

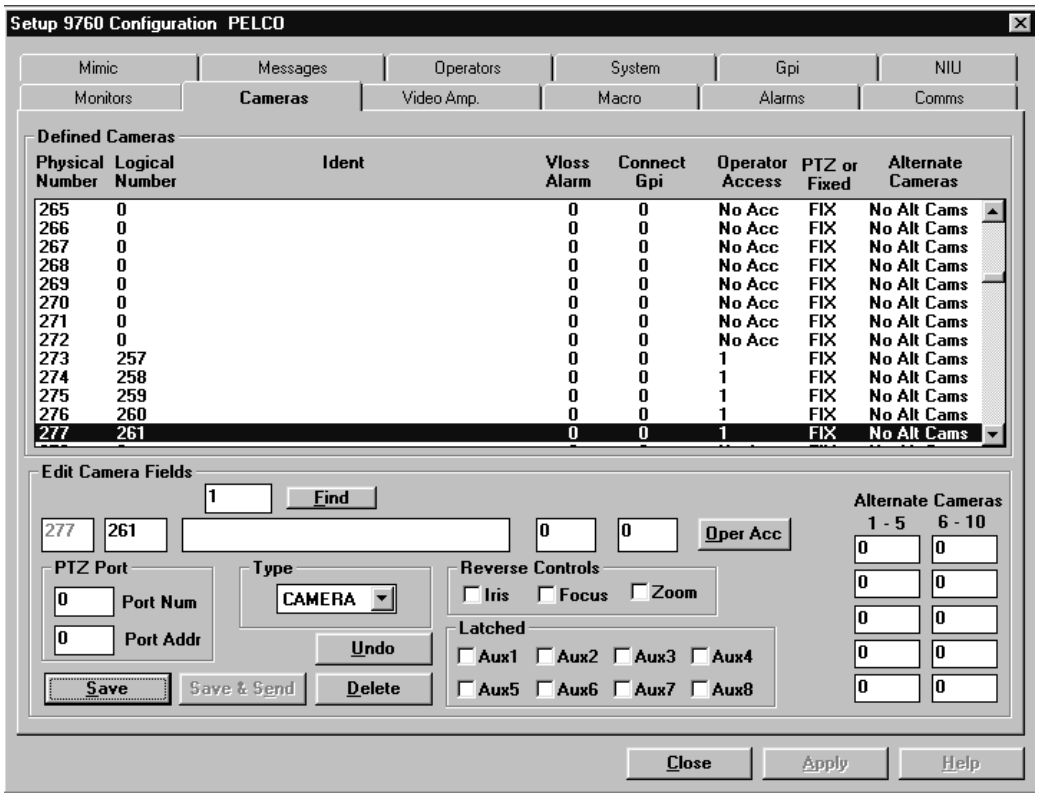


Figure 41. Physical/Logical Numbers, Sideframed Bays and Camera Files

7.0 SYSTEM TROUBLESHOOTING

If there is a problem with the matrix bay, first try pressing the reset button located on the front of the Video Output Card. This will reset the operation of the matrix bay and reload all information such as camera and monitor idents, etc. from the Controller. If this does not correct the problem, refer to various sections within this manual as well as other System 9760 documentation to try to isolate and resolve the problem. If still unsuccessful, contact Pelco for assistance.

CM9760-MXB

Electrical

Input Voltage:	120 VAC, 60 Hz or 230 VAC, 50 Hz
Power Consumption:	90 watts maximum (fully populated)
Communication:	Full duplex RS-422 using an RJ-45 connector
Video Inputs:	Sixteen input card slots for supporting 256 inputs per bay
Video Outputs:	One output card slot for supporting 16 outputs per bay
Video Input Level:	.5 to 2 Vp-p, RS-170 composite video
Impedance:	75 ohms terminating (looping versions available)
Crosstalk:	-60 dB at 3.58 MHz

General

Operating Temperature:	14° to 122°F (-10° to 50°C)
Dimensions:	19.0 (W) x 10.5 (H) x 20.0 (D) inches (48.26 x 26.67 x 50.80 cm)
Mounting:	Fits 19-inch EIA Standard rack (6 RUs)
Unit Weight:	32.0 lb (14.55 kg) 52.9 lb (24.05 kg), fully populated

CM9760-MXBL

Electrical

Input Voltage:	None (passive looping assembly)
Power Consumption:	None
Communication:	None
Video Outputs:	Sixteen DFL card slots for supporting 256 looping outputs

General

Dimensions:	19.0 (W) x 10.5 (H) x 20.0 (D) inches (48.26 x 26.67 x 50.80 cm)
Mounting:	Fits 19-inch EIA Standard rack (6 RUs)
Unit Weight:	24.2 lb (11.00 kg) 35.4 lb (16.1 kg), fully populated

(Design and product specifications subject to change without notice.)

9.0 WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship for a period of one year after the date of shipment. Exceptions to this warranty are as noted below:

- Five years on Pelco manufactured cameras (CC3500/CC3600/CC3700 and MC3500/MC3600 Series); two years on all other cameras.
- Three years on Genex® Series (multiplexers, server, and keyboard) and 090 Series Camclosure® Camera System.
- Two years on 100/150, 200 and 300 Series Camclosure® Camera Systems.
- Two years on all standard motorized or fixed focal length lenses.
- Two years on Legacy®, CM6700/CM6800/CM8500/CM9500/CM9740/CM9760 Matrix, DF5 and DF8 Series Fixed Dome products.
- Two years on Spectra®, Esprit®, and PS20 Scanners, including when used in continuous motion applications.
- Two years on Esprit and WW5700 series window wiper (excluding wiper blades).
- Eighteen months on DX Series digital video recorders.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico:

Service Department
Pelco
3500 Pelco Way
Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico:

Intermediate Consignee	***Ultimate Consignee***
American Overseas Air Freight	Pelco
320 Beach Road	3500 Pelco Way
Burlingame, CA 94010	Clovis, CA 93612-5699
USA	USA

World Headquarters
3500 Pelco Way
Clovis, California 93612 USA

USA & Canada
Tel: 800/289-9100
Fax: 800/289-9150

International
Tel: 1-559/292-1981
Fax: 1-559/348-1120

www.pelco.com

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